TOSHIBA

FILE NO. 020-200008

SERVICE MANUAL

COLOR TELEVISION

N0ES Chassis

27A30

(TAC0006)

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CHAPTER 1 GENERAL ADJUSTMENTS

SAFETY INSTRUCTIONS

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE “X-RAY RADIATION PRECAUTION”, “SAFETY PRECAUTION” AND “PRODUCT SAFETY NOTICE” INSTRUCTIONS BELOW.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is Ⓐ kV at zero beam current (minimum brightness) under a 120V AC power source. The high voltage must not, under any circumstances, exceed Ⓑ kV.

   Refer to table-1 for high voltage Ⓐ, Ⓑ.
   (See SETTING & ADJUSTING DATA on page 17.)

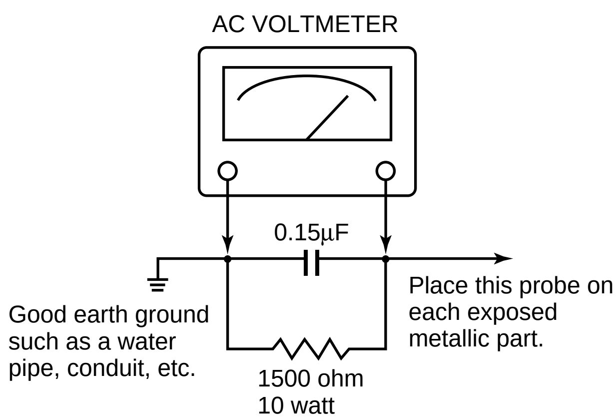
   Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. This receiver is equipped with a Fail Safe (FS) circuit which prevents the receiver from producing an excessively high voltage even if the B+ voltage increases abnormally. Each time the receiver is serviced, the FS circuit must be checked to determine that the circuit is properly functioning, following the FS CIRCUIT CHECK procedure in this manual.
3. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
4. Some part in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

SAFETY PRECAUTION

WARNING : Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter proof goggles and keep picture tube away from the unprotected body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network, etc.
4. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts, etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120V AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner:

   Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 µF, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 µF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3 volts rms. This corresponds to 0.2 milliamp. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, X-ray radiation or other hazards.

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE “X-RAY RADIATION PRECAUTION”, “SAFETY PRECAUTION” AND “PRODUCT SAFETY NOTICE” ON PAGE 3 OF THIS MANUAL.

SET-UP ADJUSTMENT (FOR 13", 14", 19", 20")

■ The following adjustments should be made when a complete realignment is required or a new picture tube is installed. Perform the adjustments in order as follows :

1. Color Purity
2. Convergence
3. White Balance

Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning. Refer to figure 1.
Mounting position of the purity magnet assembly should fit to same position as old one because slightly differnce to the position depend on a kind of tube.

* There are no adjustment of purity and convergence in some picture tube (unified with purity magnet).

COLOR PURITY ADJUSTMENT

NOTE : Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Set the brightness and contrast to maximum.
3. Use a green raster from among the built-in test signals.
4. Loosen the clamp screw holding the yoke and slide the yoke backward or forward to provide vertical green belt (zone) in the picture screen.
5. Remove the Rubber Wedges.
6. Rotate and spread the tabs of the purity magnet (See figure 2.) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, enter the raster vertically.
7. Slowly move the yoke forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8. Check the purity of the red and blue raster.

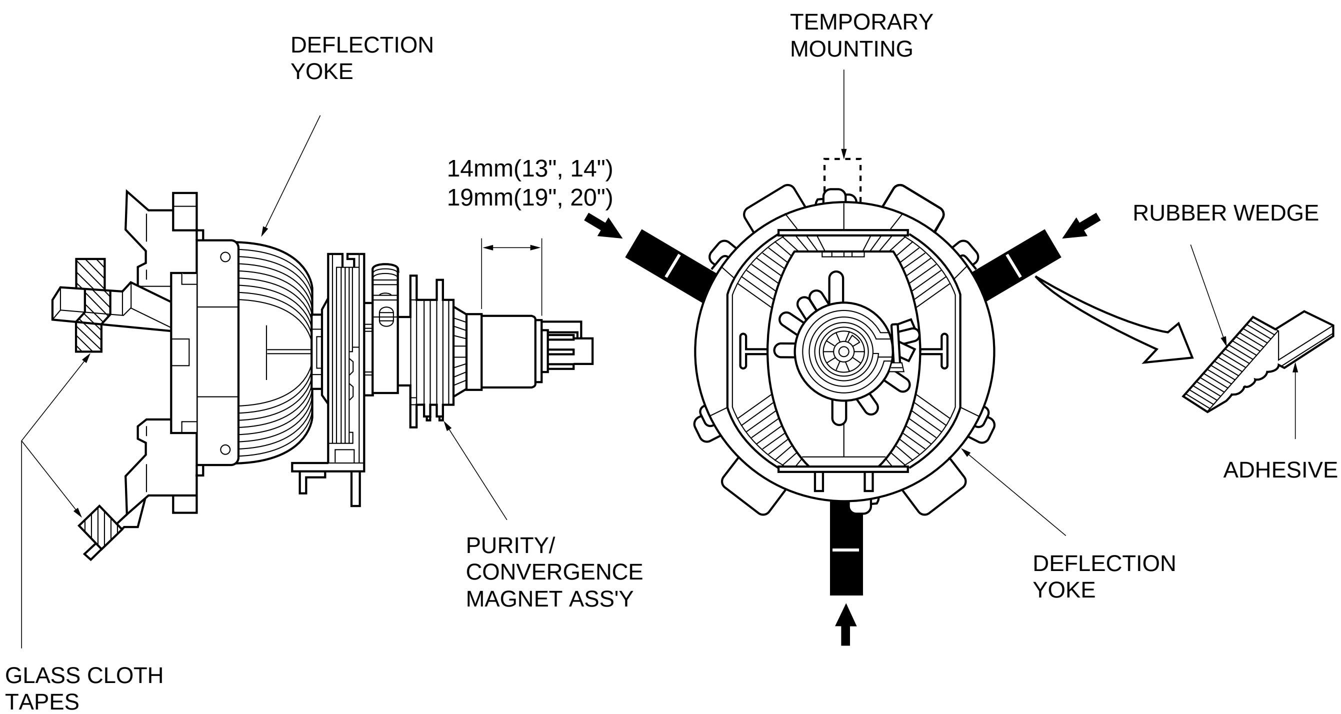


Figure 1.

CONVERGENCE ADJUSTMENTS

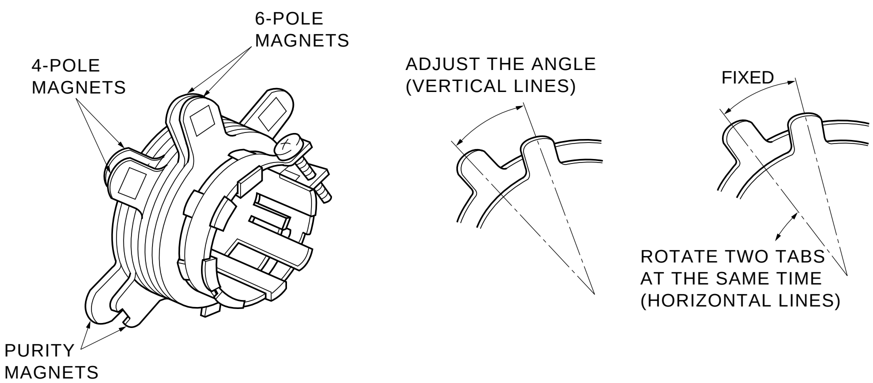
NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

■ CENTER CONVERGENCE ADJUSTMENT

1. Use the cross-dot pattern from among the built-in test signals.
2. Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 2.) and superimpose red and blue vertical lines in the center area of the picture screen.
4. Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen.
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3, 4, 5 keeping in mind red, green and blue movement, because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make dot movement complex.

■ CIRCUMFERENCE CONVERGENCE ADJUSTMENT

1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2. Temporarily put a wedge as shown in figure 1. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure 3.) Push the mounted wedge into the space between picture tube and the yoke to fix the yoke temporarily.
4. Put other wedge into bottom space and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure 3.)
6. Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9. Stick three adhesive tapes on wedges as shown in figure 1.



CONVERGENCE MAGNET ASSEMBLY

ADJUSTMENT OF MAGNETS

Figure 2.



4-POLE MAGNETS MOVEMENT

6-POLE MAGNETS MOVEMENT

Center Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN)

INCLINE THE YOKE RIGHT (OR LEFT)

Circumference Convergence by DEF Yoke

Figure 3. Dot Movement Pattern

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE “X-RAY RADIATION PRECAUTION”, “SAFETY PRECAUTION” AND “PRODUCT SAFETY NOTICE” ON PAGE 3 OF THIS MANUAL.

(FOR 35", 36")

■ The following adjustments should be made when a complete realignment is required or a new picture tube is installed. Perform the adjustments in order as follows :

1. Color Purity
2. Convergence
3. White Balance

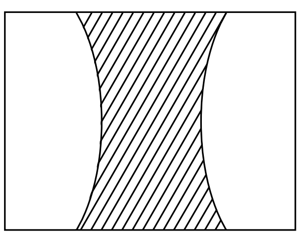
Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning. Refer to figure 1.
Mounting position of the purity magnet assembly should fit to same position as old one because slightly differnce to the position depend on a kind of tube.

■ There are no adjustment of purity and convergence in some picture tube (unified with purity magnet).

COLOR PURITY ADJUSTMENT

NOTE : Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

1. Evenly degauss the entire screen.
2. Set the CONTRAST and BRIGHTNESS Controls to the maximum.
3. Display built-in green raster using the TEST SIGNAL SELECTION function.
4. Loosen the clamp screw holding the deflection yoke (and remove the Rubber Wedges).
5. Slide the yoke forward or backward to provide vertical green belt (zone) in the picture screen.
6. Rotate and spread the tabs of the purity magnet (See figure 4.) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, center the raster vertically by adjusting the magnet as shown below.



Green Belt

7. Move the yoke slowly forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8. Check the purity of the red and blue raster.
9. Put four wedges into the space between the picture tube and the yoke to hold the yoke in the adjusted position. (See figure 2.)
Do not tilt the yoke by excessive insertion of the wedge.
10. Remove cover paper of wedge and stick wedges on the tube to fix the yoke in the adjusted position.
Fix the wedges with glass cloth tapes.

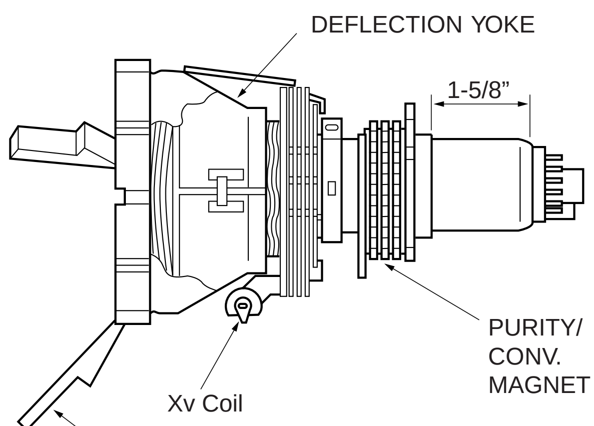


Figure 1.

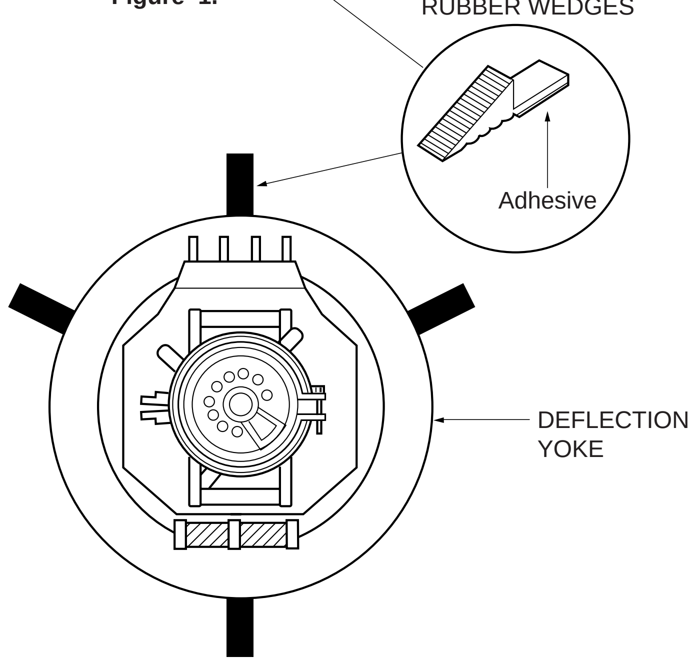


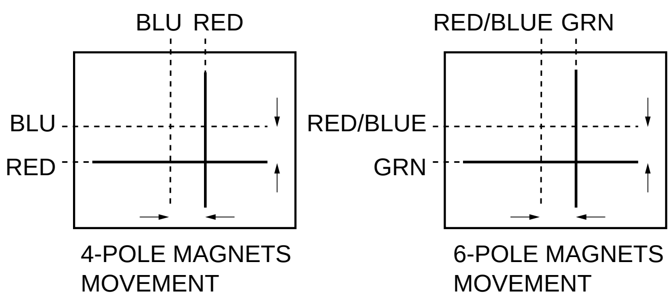
Figure 2.

CONVERGENCE ADJUSTMENTS

NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

■ CENTER CONVERGENCE ADJUSTMENT

1. Display built-in cross-dot pattern using the TEST SIGNAL SELECTION function.
2. Adjust the BRIGHTNESS and CONTRAST Controls for well defined pattern.
3. Loosen the tightening ring and adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 4.) and superimpose red and blue vertical lines in the center area of the picture screen. (See figure 3.)
4. Turn the both tabs at the same time keeping the constant angle to superimpose red and blue horizontal lines at the centre of the screen. (See figure 3.)
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line with green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3, 4, 5 keeping in mind red, green and blue movement, because 4-Pole Magnets and 6-Pole magnets interact and make dot movement complex.
7. After completing the “CENTER CONVERGENCE ADJUSTMENT”, tighten the tightening ring to fix the magnets.

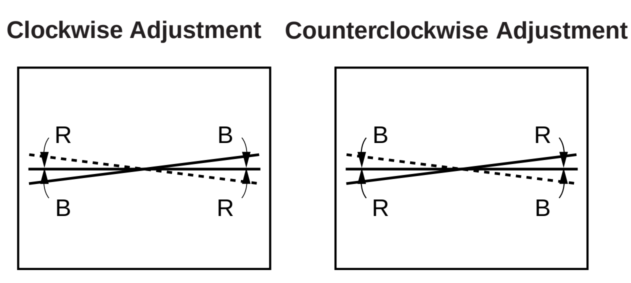


Center Convergence by Convergence Magnets

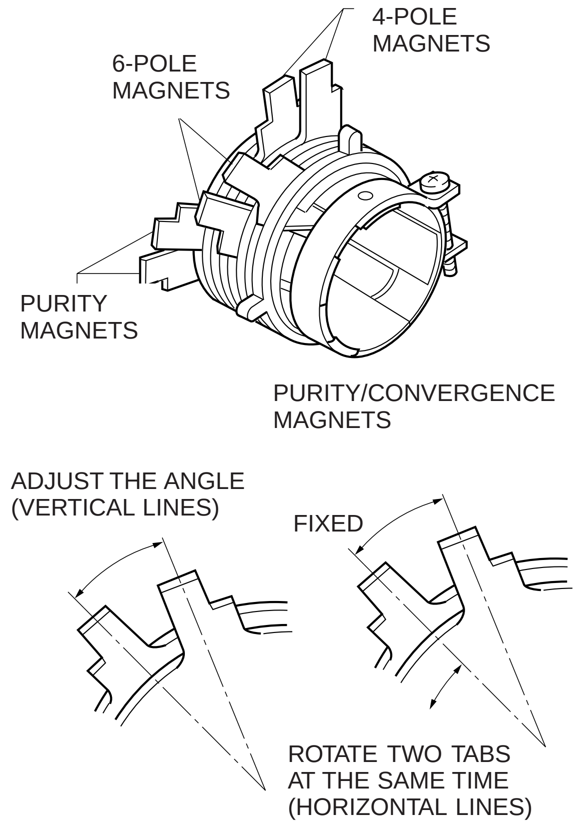
Figure 3.

■ Xv COIL ADJUSTMENT

Adjust the Xv coil (on the deflection yoke) to correct misconvergence at both sides on screen.
Use a hexagonal tip stick (plastic) to adjust the core of coil.



X_V Cross Pattern View



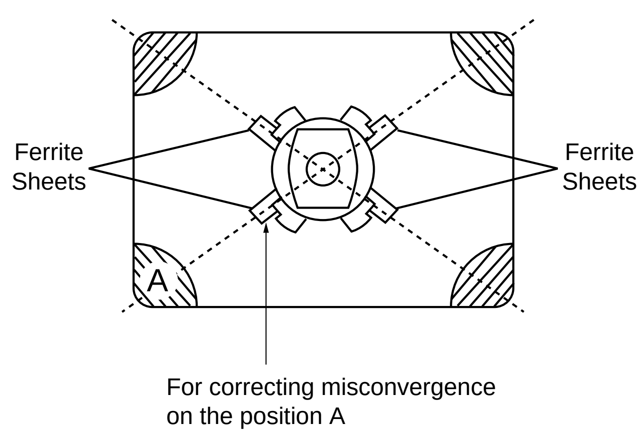
ADJUSTMENT OF MAGNETS

Figure 4.

■ SCREEN-CORNER CONVERGENCE

When the misconvergence is still evident on corners even though the above adjustment is done, use the ferrite sheet (Part No. 23993622) to correct misconvergence.

1. Put ferrite sheets into the space under the yoke. Decide such position that misconvergence becomes minimum, watching picture screen. (See figure below.)
2. Remove cover paper of ferrite sheet to stick it in the place on the tube. Put adhesive tapes on ferrite sheets to fix.



SERVICE MODE

1. ENTERING TO SERVICE MODE

1) Press MUTE button once on Remote Control.

2) Press MUTE button again to keep pressing.

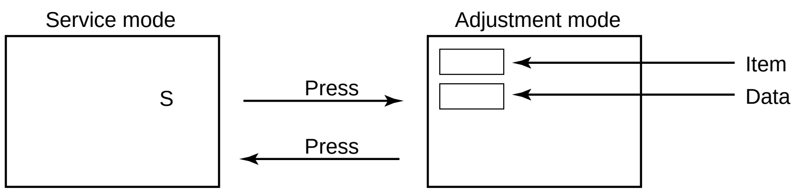
3) While pressing the MUTE button, press MENU button on TV set.



(Service mode display)

2. DISPLAYING THE ADJUSTMENT MENU

1) Press MENU button on TV.



3. KEY FUNCTION IN THE SERVICE MODE

The following key entry during display of adjustment menu provides special functions.

A single horizontal line ON/OFF:	TV (ANT)/VIDEO button (on TV)
Test signal selection :	TV (ANT)/VIDEO button (on Remote)
Selection of the adjustment items :	Channel ▲/▼ (on TV or Remote)
Change of the data value :	Volume ▲/▼ (on TV or Remote)
Adjustment menu mode ON/OFF :	MENU button (on TV)
Initialization of the memory (QA02) :	RECALL+Channel (▲) button on TV
Initialization of the self diagnostic data:	RECALL+Channel (▼) button on TV

“RCUT” selection :	1 button
“GCUT” selection :	2 button
“BCUT” selection :	3 button
“CNTX” selection :	4 button
“COLC” selection :	5 button
“TNTC” selection :	6 button
Test audio signal ON/OFF (1kHz) :	8 button
Self diagnostic display ON/OFF :	9 button

4. SELECTING THE ADJUSTING ITEMS

1) Every pressing of CHANNEL ▲ button in the service mode changes the adjustment items in the order of table-2. (▼ button for reverse order)

Refer to table-2 for preset data of adjustment mode.
(See SETTING & ADJUSTING DATA on page 17.)

5. ADJUSTING THE DATA

1) Pressing of VOLUME ▲ or ▼ button will change the value of data in the range from 00H to FFH. The variable range depends on the adjusting item.

6. EXIT FROM SERVICE MODE

1) Pressing POWER button to turn off the TV once.

■ **INITIALIZATION OF MEMORY DATA OF QA02**

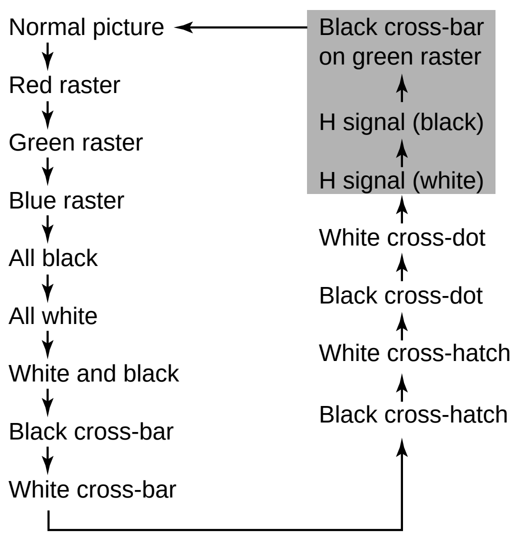
After replacing QA02, the following initialization is required.

1. Enter the service mode, then select any register item.
2. Press and hold the RECALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been completed.
3. Check the picture carefully. If necessary, adjust any adjustment item above. Perform “Programming Channel Memory” on the owner's manual.

CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

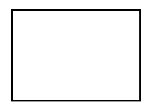
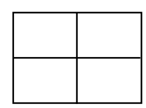
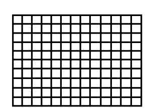
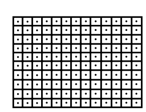
7. TEST SIGNAL SELECTION

1) Every pressing of TV/VIDEO button on the Remote Control in the service mode changes the built-in test patterns on screen in the following order.



2) Press “8” button while any built-in test pattern to on the screen to output the 1 kHz sound. Press the button again to cut off the sound.

Note: If the video cable is connected to the VIDEO1 INPUT jack, the built-in pattern signals are not displayed.

Signals	Picture
• Red raster • Green raster • Blue raster • All Black • All White	
• Black & White	
• Black cross-bar • White cross-bar • Black cross-bar on green raster	
• Black cross-hatch • White cross-hatch	
• Black cross-dot • White cross-dot	
• H signal (white) • H signal (black)	

*The signals marked with ▇ are not usable to display in the test signal for some model.

GENERAL ADJUSTMENTS

8. SELF DIAGNOSTIC FUNCTION

1) Press “9” button on Remote Control during display of adjustment menu in the service mode. The diagnosis will begin to check if interface among IC’s are executed properly.
2) During diagnosis, the following displays are shown.

```
    SELF CHECK
①  NO. 2390XXXX
②  POWER     : 000
③  BUS LINE  : OK
④  BUS CONT : OK
⑤  BLOCK : UV V1 V2
   (or      VOUT1 VOUT2
   SYNC)    QV01 QV01S
```

① Part number of microprocessor (QA01)

② Operation number of protection circuit (current limiter) . . . . “000” is normal.

③ BUS line check
- “OK” .... Normal
- “SCL-GND” or “NG” .... SCL-GND short circuit
- “SDA-GND” or “NG” .... SDA-GND short circuit
- “SCL-SDA” or “NG” .... SCL-SDA short circuit

④ BUS line ACK (acknowledge) check
- “OK” .... Normal
- Display of Location Number . . . . NG
- (Display example)
- “QA02 NG”, “H001 NG”, “Q501 NG”, etc.
- Note: The indication of failure place is only one place though failure places are plural. When repair of a failure place finishes, the next failure place is indicated. (The order of priority of indication is left side.)

⑤ Sync. signal check
- Green display..... Normal
- Cyan display ...... No check
- Red display .... NG

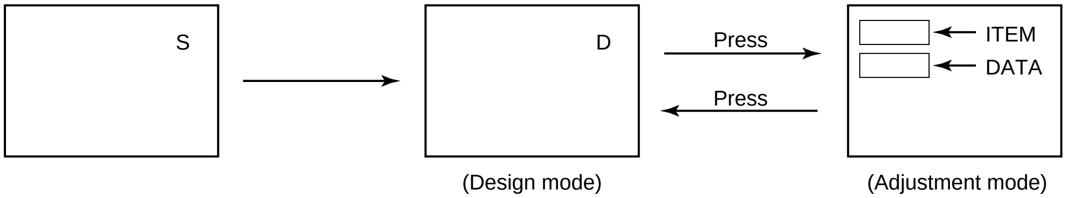
[UV .... TV mode
V1 .... VIDEO 1 mode
V2 .... VIDEO 2 mode]

* The items marked with ░ are not usable to display in the SELF DIAGNOSTIC FUNCTION for some model.

DESIGN MODE

1. ENTERING TO DESIGN MODE

1) Select the Service mode.
2) While pressing RECALL button on Remote and press MENU button on TV.
3) Press MENU button on TV.



When QA02 is initialized, items “OPT0” and “OPT1” of DESIGN MODE are set to the data of the representative model of this chassis family.
Therefore, because ON-SCREEN specification remains in the state of the representative of model. This model is required to reset the data of items “OPT0” and “OPT1”.

2. SELECTING THE ADJUSTING ITEMS

Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

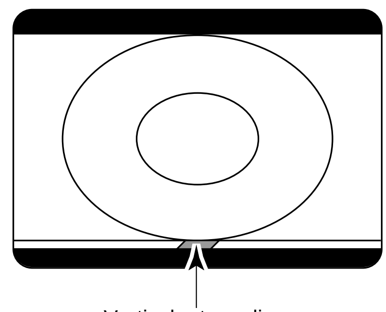
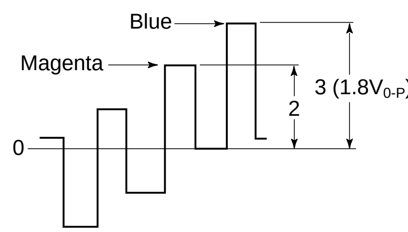
Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 17.)

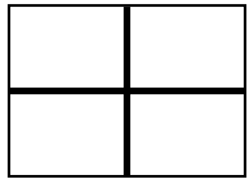
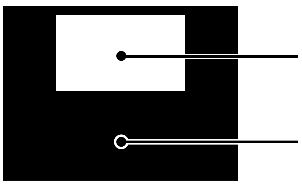
3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ button will change the value of data.

GENERAL ADJUSTMENTS

ELECTRICAL ADJUSTMENTS

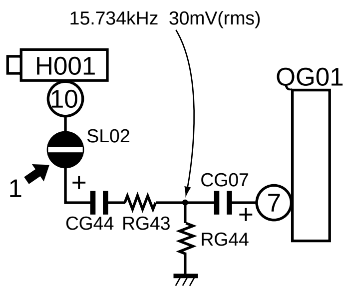
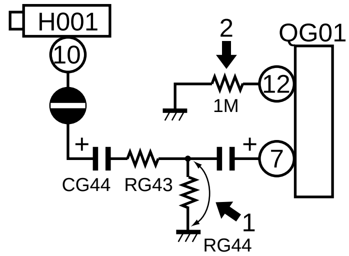
ITEM	ADJUSTMENT PROCEDURE
FOCUS VR ADJ	1. Enter the service mode, then select any register item. 2. Press the TV/VIDEO button on the Remote until the black cross-bar pattern appears on the screen. 3. Adjust the FOCUS control (on T461) for well defined scanning lines on the picture screen.
SUB-BRIGHTNESS (BRTC)	1. Constrict the picture height until the vertical retrace line appears adjusting the HEIGHT control on the MAIN board. 2. Adjust the CONTRAST to the minimum and BRIGHTNESS to the center. 3. Enter the service mode, then select "**BRTC**" register. 4. Adjust the data value so the belt of vertical retrace line just disappear. 5. Adjust the CONTRAST for the desired contrast. 6. Adjust the HEIGHT control. 
SUB-COLOR (COLC) SUB-TINT (TNTC)	1. Receive color-bar signal from color-bar generator. 2. Press the RESET button. 3. Connect oscilloscope to base of Q906 on CRT-D board. 4. Enter the service mode, then select "**COLC**". 5. Adjust the SUB-COLOR by pressing the VOLUME ▲ or ▼ button to achieve about $1V_{0\text{-}p}$ of blue bar. 6. Select "**TNTC**" register. 7. Adjust the data value to obtain the blue bar to magenta bar ratio of 3:2 as shown. 8. Select "**COLC**" register. 9. Adjust the data value to achieve $1.8_{0\text{-}p}$ of blue bar on scope. 10. Check the picture with off-air signal. 
WIDTH (WID)	1. Call up the adjustment mode display, then select the item **WID**. 2. Press the VOLUME ▲ or ▼ button to get the picture so the left and right edges of raster begins to lack. 3. Press the VOLUME ▲ or ▼ button to advance the data by 7 steps. Note : Check the horizontal picture position is correct.

ITEM	ADJUSTMENT PROCEDURE
HORIZONTAL POSITION (HPOS) VERTICAL POSITION (VPOS)	1. Call up the adjustment mode display, then select the item **HPOS** or **VPOS**. 2. Press the TV/VIDEO button on Remote until the white cross-bar or black cross-bar pattern appears on the screen. 3. Adjust the HORIZONTAL and VERTICAL position alternately by pressing the VOLUME ▲ or ▼ button for proper picture position. 4. Check the picture with off-air signal. 
HEIGHT (HIT)	1. Call up the adjustment mode display, then select the item **HIT**. 2. Press the VOLUME ▲ or ▼ button to get the picture so the top of raster begins to lack. 3. Press the VOLUME ▲ button to advance the data by 8 steps. Note : Check the vertical picture position is correct.
WHITE BALANCE (RCUT) (GCUT) (BCUT) (GDRV) (BDRV)	1. Adjust the CONTRAST control to the center, and BRIGHTNESS control to the maximum. 2. Call up the adjustment mode display, and press the TV/VIDEO button on Remote until the white and black pattern appears on the screen. 3. Adjust the following item with the CHANNEL ▲/▼ and VOLUME ▲/▼ buttons. RCUT ⟶ Data : 40H GCUT ⟶ Data : 40H BCUT ⟶ Data : 40H GDRV ⟶ Data : 80H BDRV ⟶ Data : 80H 4. Press the TV/VIDEO button on TV to display a single horizontal line on the screen. 5. Turn the SCREEN control (FBT) fully counterclockwise and gradually rotate clockwise until the first horizontal line appears slightly on the screen. 6. Press the TV/VIDEO button to display the normal picture. 7. Adjust the remaining two “?CUT” items (CHANNEL ▲/▼ → TV/VIDEO → VOLUME ▲/▼ in order) to obtain the slightly lighted horizontal line in the same levels of three (red, green, blue) colors. The line should be white if the adjustments are proper.  Bright area Adjust "GDRV" or "BDRV" to be white. Dark area Fine adjust "RCUT", "GCUT" or "BCUT" to be black.

MTS ADJUSTMENT (FOR N5ES/N7S CHASSIS)

No.	ITEM	INPUT SIGNAL	ADJUSTMENT PROCEDURE
1	ATTENUATOR (ATT)	• 1kHz 30% mod. → ANT terminal	1. Connect rms meter to pin 12 of H002. 2. Display item **ATT** on screen. 3. Change data by VOLUME ▲/▼ buttons so that output at pin 12 of H002 becomes value as close as 142mVrms.
2	STEREO VCO (STVC)	• No signal	1. Display item **STVC**, and connect pin 9 of H002 to ground. 2. Connect frequency counter to pin 12 of H002. 3. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 4fH (62.936kHz).
3	SAP VCO (SAVC)	• 78.670kHz 147mVrms → pin 9 of H002 • Monaural signal → ANT	1. Display item **SAVC**. 2. Change data by VOLUME ▲/▼ buttons so that the data becomes in the center of range for STA7=0 and STA8=1. SAVC XXH STA7:0 STA8:1
4	STEREO FILTER (STRF)	• 9.4kHz 600mVrm → pin 9 of H002 Monaural signal → ANT	1. Display item **STRF** on screen. 2. Change data by VOLUME ▲/▼ buttons so that the data becomes in the center of range for STA3=1. STRF XXH STA3:1
5	SAP FILTER (SAPF)	• 88kHz 120mVrms → pin 9 of H002 • Monaural signal → ANT	1. Display item **SAPF**. 2. Change data by VOLUME ▲/▼ buttons so that the data becomes in the center of range for STA4=1. SAPF XXH STA4:1
6	STEREO SEPARATION (WBAN)	• STEREO 300Hz R-channel only → ANT	1. Select “STEREO” mode from the MTS function in the Audio menu. 2. Display item **WBAN** on screen. 3. Connect oscilloscope to pin 14 of H002. 4. Change data by VOLUME ▲/▼ buttons so that 300Hz element on scope becomes minimum.
	(SPEC)	• STEREO 3kHz R-channel only → ANT	5. Display item **SPEC** on screen. 6. Change data by VOLUME ▲/▼ buttons so that 3kHz element on scope becomes minimum.

MTS ADJUSTMENT (FOR N0ES CHASSIS)

No.	ITEM	INPUT SIGNAL	ADJUSTMENT PROCEDURE
1	ATTENUATOR (ATT)	• 1kHz 30% mod. → ANT terminal	1. Connect rms meter to pin 34 of QG01. 2. Display item **ATT** on screen. 3. Change data by VOLUME ▲/▼ buttons so that the reading of meter becomes value as close as 137mVrms.
2	STEREO VCO (STVC)	• No signal	1. Short circuit RG44 with a jumper wire. 2. Display item **STVC** on screen. 3. Connect frequency counter to pin 34 of QG01. 4. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 15.73kHz.
3	STEREO FILTER (STRF)	• 15.734kHz 30mV(rms) 	1. Unsolder the solder link SL02. 2. Display item **STRF** on screen. 3. Connect oscilloscope to pin 34 of QG01. 4. Change data by VOLUME ▲/▼ buttons to minimize AC output level on scope. 5. Resolder SL02.
4	STEREO SEPARATION (WBAN)	• STEREO 300Hz R-channel only → ANT	1. Display item **WBAN** on screen. 2. Connect oscilloscope to pin 35 of QG01. 3. Change data by VOLUME ▲/▼ buttons so that 300Hz element on scope becomes minimum.
	(SPEC)	• STEREO 3kHz R-channel only → ANT	4. Display item **SPEC** on screen. 5. Change data by VOLUME ▲/▼ buttons so that 3kHz element on scope becomes minimum.
5	SAP VCO (SAVC)	• No signal 	1. Shortcircuit RG44 with a short jumper. 2. Connect 1Mohm resistor between pin 12 of QG01 and ground. 3. Display item **SAVC** on screen. 4. Connect frequency counter to pin 34 of QG01. 5. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 78.67kHz. 6. Remove the short jumper and 1M ohm resistor.

CIRCUIT CHECKS

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. Checking should be done following the steps below.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be measured below Ⓑ kV.

   Refer to table-1 for high voltage Ⓑ.
   (See SETTING & ADJUSTING DATA on page 17.)

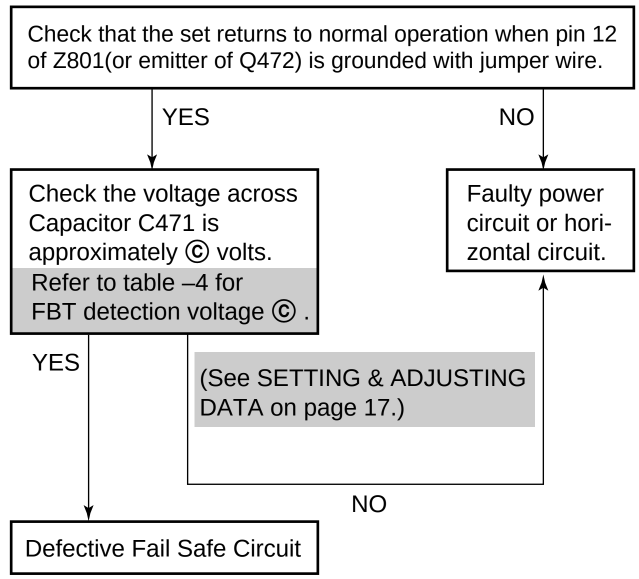
4. Vary the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the limit under any conditions.

FS CIRCUIT CHECK

The Fail Safe (FS) circuit check is indispensable for the final check in servicing. Checking should be done following the steps below.

1. Turn the receiver on and press the RESET button.
2. Temporarily short TP-Ⓡ and TP-Ⓧ with a jumper wire. Raster and sound will disappear.
3. The receiver must remain in this state even after removing the jumper wire. This is the evidence that the FS circuit is functioning properly.
4. To obtain a picture again, temporarily turn the receiver off and allow the FS circuit more than 5 seconds to reset. Then turn the power switch on to produce a normal picture.

Troubleshooting Guide for Fail Safe Circuit



SETTING & ADJUSTING DATA

【SAFETY INSTRUCTIONS】

		27"
HIGH VOLTAGE AT ZERO BEAM:	Ⓐ	28.1kV
MAX HIGH VOLTAGE:	Ⓑ	29.5 kV

Table-1

【SERVICE MODE】

ADJUSTING ITEMS AND DATA IN THE SERVICE MODE:

Item	Name of adjustment	Preset	Data
RCUT	R CUTOFF	40H	←
GCUT	G CUTOFF	40H	←
BCUT	B CUTOFF	40H	←
GDRV	G DRIVE	80H	←
BDRV	B DRIVE	80H	←
CNTX	SUB-CONTRAST	50H	←
BRTC	SUB-BRIGHT	40H	←
COLC	SUB-COLOR	2CH	←
TNTC	SUB-TINT	42H	←
SAVC	SAP VCO	20H	←
ATT	ATTENUATOR	20H	←
STVC	STEREO VCO	20H	←
STRF	STEREO FILTER	20H	←
SPEC	SPECTRAL	20H	←
WBAN	STEREO SEPARATION	20H	←
HPOS	HORIZ. POSITION	16H	←

Item	Name of adjustment	Preset	Data
VPOS	VERT. POSITION	02H	←
HIT	HEIGHT	20H	25H

Table-2

【DESIGN MODE】

ADJUSTING ITEMS AND DATA IN THE DESIGN MODE:

Item	Name of adjustment	Preset Data	Data 27"	Remarks
OPT0	OPTION 0	A2H	E2H	
OPT1	OPTION 1	06H	06H	

Table-3

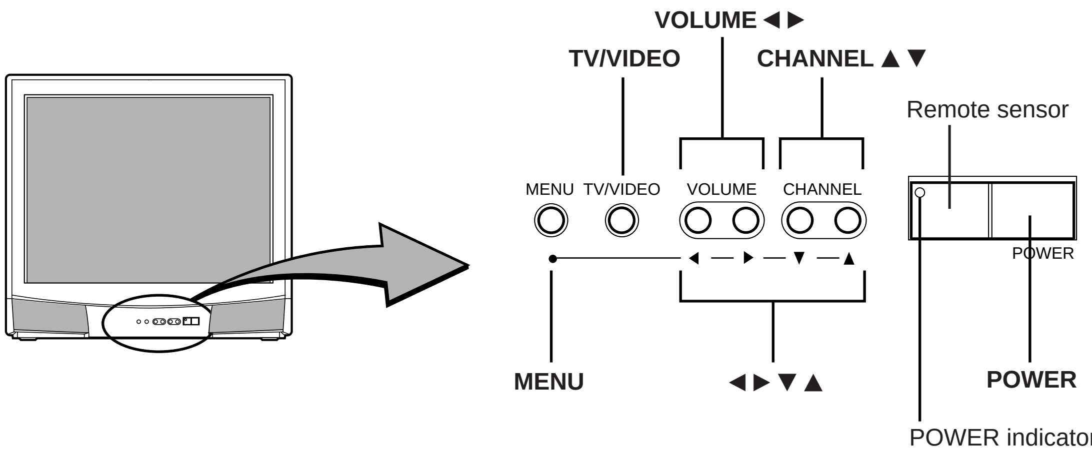
【CIRCUIT CHECKS】

FBT DETECTION VOLTAGE	Ⓒ	21.4V

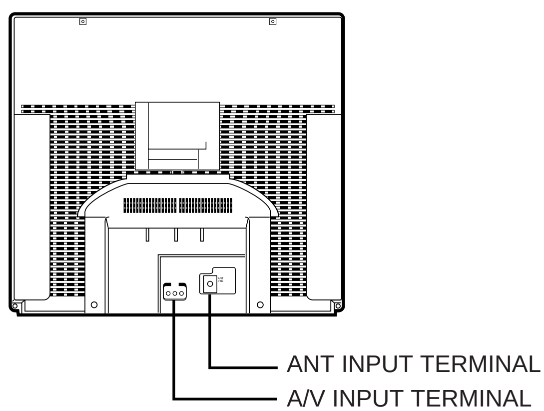
Table-4

LOCATION OF CONTROLS

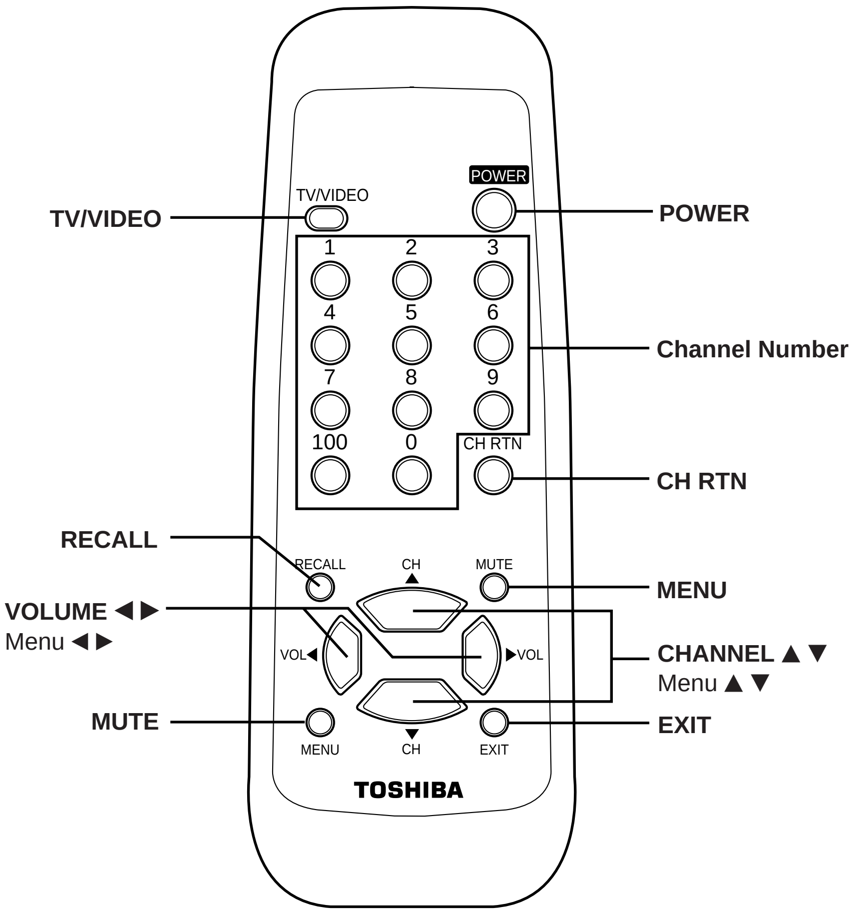
TV front



TV rear



Remote Control



SPECIFIC INFORMATIONS

PROGRAMMING CHANNEL MEMORY

The channel memory is a list of TV channel numbers your TV will stop on when you press the CHANNEL ▲ or ▼ button.
First, use the TV/CABLE and CH PROGRAM functions to preset all active channels in your area.
If necessary, arrange the preset channels with the ADD/ERASE functions so that you can tune into only desired channels.

SPECIFIC INFORMATIONS

TV/CABLE function

1 Press **POWER** to turn on the TV.

2 Press **MENU** repeatedly until the Setup menu is displayed on the screen.

3 Press ▼ or ▲ repeatedly until "TV/CABLE" is displayed in purple.

4 Press ◀ or ▶ until the mode that corresponds to your TV signal system is displayed in purple.
TV: TV broadcasts signals.
(VHF channels 2 through 13 and UHF channels 14 through 69)
CABLE: Cable TV signals.
(Cable channels 1 through 125)

CH PROGRAM function

1 Press **MENU** repeatedly until the Setup menu is displayed on the screen.

2 Press ▲ or ▼ repeatedly until "CH PROGRAM" is displayed in purple.

3 Press ◀ or ▶ to start channel programming.
The TV will automatically cycle through all the TV or CABLE channels depending on the mode selected, and store active channels in the channel memory.

4 When channel programming is complete, you will see the message on the screen.

5 Press **CHANNEL** ▲ or ▼ to make sure the channel programming has been done properly.

ADD/ERASE function

After performing the CH PROGRAM function, you can add or erase specific channels.

1 Select the channel you want to erase using the **CHANNEL** ▲ or ▼ button, or select the channel you want to add using the **Channel Number** buttons.

2 Press **MENU** repeatedly until the Setup menu is displayed on the screen.

3 Press ▼ or ▲ repeatedly until "ADD/ERASE" is displayed in purple.

4 Press ◀ or ▶ :
To erase the channel
Press the button until "ERASE" is displayed in purple indicating that the channel has been erased from the memory.

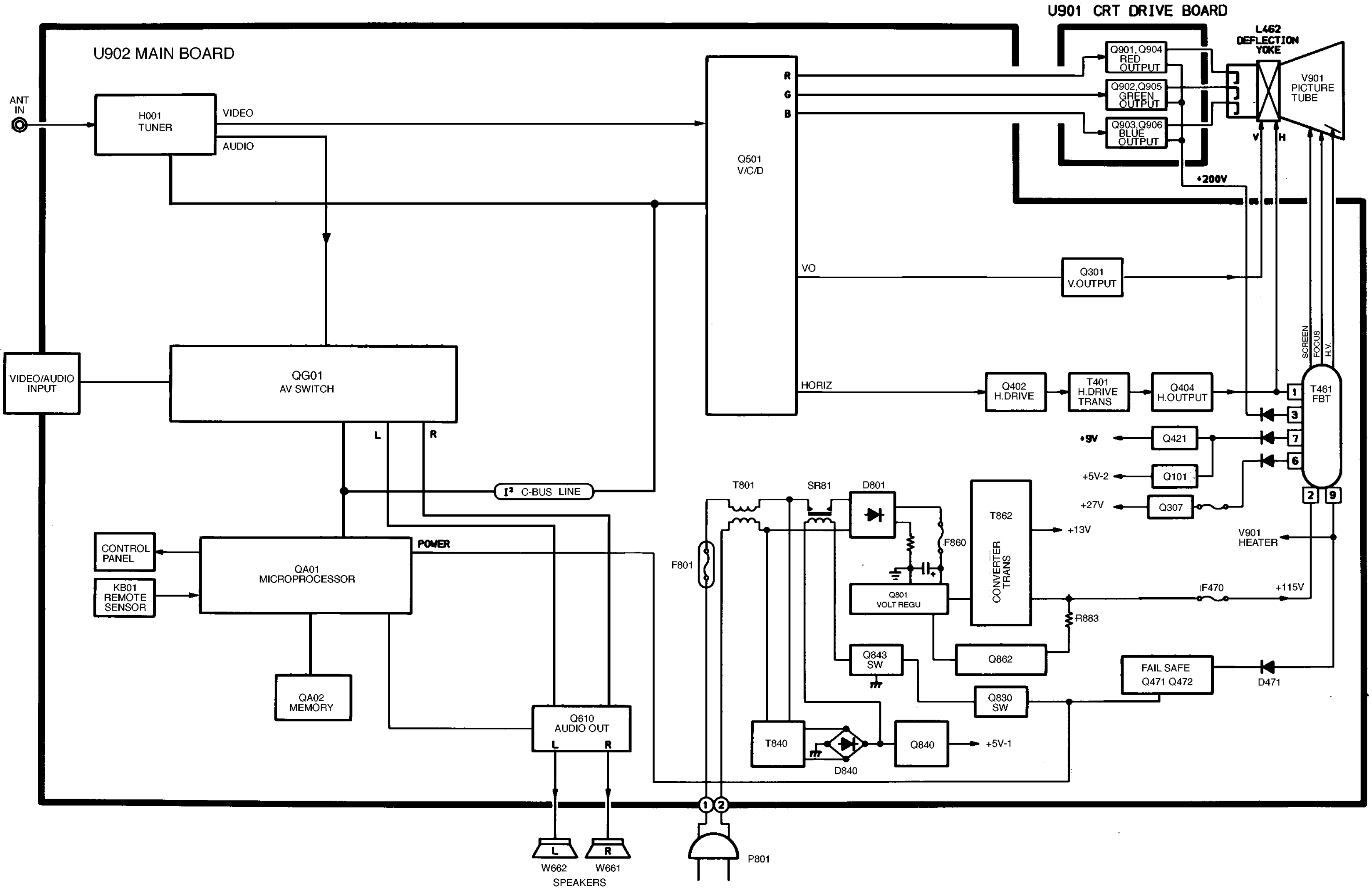
To add the channel
Press the button until "ADD" is displayed in purple indicating that the channel has been memorized.

5 Repeat steps 1 to 4 for other channels.

You have now completed the channel programming.

* Please refer to owner's manual in detail.

CIRCUIT BLOCK DIAGRAM



SPECIFIC INFORMATIONS

CHASSIS AND CABINET REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

CAUTION: The international hazard symbols "⚠" in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

NOTICE:
- *The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.*
- *The PC board assembly with ⁎ mark is no longer available after the end of the production.*

Model : 27A30

Capacitors	CD	: Ceramic Disk	PF	: Plastic Film	EL	: Electrolytic
Resistors	CF	: Carbon Film	CC	: Carbon Composition	MF	: Metal Film
	OMF	: Oxide Metal Film	VR	: Variable Resistor	FR	: Fusible Resistor

(All CD and PF capacitors are ±5%, 50V and all resistors, ±5%, 1/6W unless otherwise noted.)

Location No.	Part No.	Description
CAPACITORS		
C102	24793101	EL, 100μF, ±20%, 10V
C105	24212102	CD, 1000pF, ±10%
C106	24797479	EL, 4.7μF, ±20%, 50V
C107	24763221	EL, 220μF, ±20%, 16V
C201	24085957	EL, 0.47μF, ±20%, 40V, Non-Polar
C205	24794220	EL, 22μF, ±20%, 16V
C207	24794100	EL, 10μF, ±20%, 16V
C208	24797010	EL, 1μF, ±20%, 50V
C209	24085944	EL, 2.2μF, ±20%, 50V, Non-Polar
C210	24794470	EL, 47μF, ±20%, 16V
C230	24794470	EL, 47μF, ±20%, 16V
C232	24206108	EL, 0.1μF, ±20%, 50V
C233	24794100	EL, 10μF, ±20%, 16V
C234	24436150	CD, 15pF
C301	24617912	EL, 2.2μF, ±10%, 50V
C302	24212152	CD, 1500pF, ±10%
C305	24617915	EL, 1μF, ±10%, 50V
C306	24073058	EL, 2200μF, ±20%, 25V
C307	24693333	PF, 0.033μF, 100V
C308	24668221	EL, 220μF, ±20%, 35V
C309	24591102	PF, 1000pF
C310	24796102	EL, 1000μF, ±20%, 35V
C311	24214101	CD, 100pF, ±10%, 500V
C313	24082057	PF, 0.22μF, 100V
C314	24591563	PF, 0.056μF
C315	24797229	EL, 2.2μF, ±20%, 50V
C317	24214471	CD, 470pF, ±10%, 500V
C320	24668101	EL, 100μF, ±20%, 35V
C370	24794101	EL, 100μF, ±20%, 16V
C371	24667100	EL, 10μF, ±20%, 25V
C403	24591203	PF, 0.02μF
C404	24797229	EL, 2.2μF, ±20%, 50V
C413	24214391	CD, 390pF, ±10%, 500V
C416	24676100	EL, 10μF, ±20%, 100V
C417	24214471	CD, 470pF, ±10%, 500V
C421	24794470	EL, 47μF, ±20%, 16V
C430	24232103	CD, 0.01μF, +80%, -20%
C431	24794331	EL, 330μF, ±20%, 16V
⚠ C440	24082423	PF, 7500pF, ±3%, 1250V
⚠ C442	24082701	PF, 0.62μF, 250V
⚠ C444	24082420	PF, 0.007μF, AC1250V
C445	24828124	PF, 0.12μF, 200V
C446	24679100	EL, 10μF, ±20%, 250V
C448	24640908	EL, 33μF, ±20%, 160V
C449	24667102	EL, 1000μF, ±20%, 25V
C450	24539224	PF, 0.22μF
C451	24590563	PF, 0.056μF
C463	24212152	CD, 1500pF, ±10%
C471	24797479	EL, 4.7μF, ±20%, 50V
C474	24794100	EL, 10μF, ±20%, 16V
C480	24747220	EL, 22μF, ±20%, 50V
C481	24567474	PF, 0.47μF
C482	24766478	EL, 0.47μF, ±20%, 50V
C504	24353090	CD, 9pF, ±0.25pF, CH
C510	24797229	EL, 2.2μF, ±20%, 50V
C514	24591223	PF, 0.022μF
C661	24212102	CD, 1000pF, ±10%
C662	24212102	CD, 1000pF, ±10%
C663	24794100	EL, 10μF, ±20%, 16V
C671	24667470	EL, 47μF, ±20%, 25V
C672	24667470	EL, 47μF, ±20%, 25V
C673	24669229	EL, 2.2μF, ±20%, 50V
C676	24539104	PF, 0.1μF
C677	24539104	PF, 0.1μF
C678	24669229	EL, 2.2μF, ±20%, 50V
C679	24667470	EL, 47μF, ±20%, 25V
C681	24667471	EL, 470μF, ±20%, 25V
C682	24667101	EL, 100μF, ±20%, 25V
C683	24667471	EL, 470μF, ±20%, 25V
C801	24082001	PF, 0.47μF, AC125V
C810	24086061	EL, 470μF, ±20%, 200V
C811	24092585	CD, 4700pF, ±20%, AC250V
C812	24092583	CD, 2200pF, ±20%, AC250V
C813	24092270	CD, 4700pF, ±20%, AC400V
C814	24094820	PF, 2200pF, ±20%, AC250V
C832	24793101	EL, 100μF, ±20%, 10V
C840	24795471	EL, 470μF, ±20%, 25V
C842	24792101	EL, 100μF, ±20%, 6.3V
C843	24539104	PF, 0.1μF

Location No.	Part No.	Description
C860	24214103	CD, 0.01μF, ±10%, 500V
C861	24212471	CD, 470pF, ±10%
C862	24591224	PF, 0.22μF
C863	24539104	PF, 0.1μF
C865	24092345	CD, 1000pF, ±10%, 2kV
C866	24669010	EL, 1μF, ±20%, 50V
C867	24212682	CD, 6800pF, ±10%
C868	24667101	EL, 100μF, ±20%, 25V
C869	24678229	EL, 2.2μF, ±20%, 200V
C870	24095800	PF, 0.082μF, 400V
C871	24092345	CD, 1000pF, ±10%, 2kV
C874	24435221	CD, 220pF, 500V
C875	24435471	CD, 470pF, 500V
C876	24539104	PF, 0.1μF
C884	24640018	EL, 220μF, ±20%, 160V
C885	24214471	CD, 470pF, ±10%, 500V
C886	24214471	CD, 470pF, ±10%, 500V
C889	24795222	EL, 2200μF, ±20%, 25V
C891	24082229	PF, 0.1μF, ±10%, 250V
C893	24092337	CD, 220pF, ±10%, 2kV
C894	24092337	CD, 220pF, ±10%, 2kV
C898	24591104	PF, 0.1μF
C902	24211102	CD, 1000pF, ±10%, 2kV
C921	24212681	CD, 680pF, ±10%
C922	24212561	CD, 560pF, ±10%
C923	24212561	CD, 560pF, ±10%
C972	24794100	EL, 10μF, ±20%, 16V
CA01	24472100	CD, 10pF
CA02	24472100	CD, 10pF
CA12	24212101	CD, 100pF, ±10%
CA33	24232103	CD, 0.01μF, +80%, -20%
CA37	24212101	CD, 100pF, ±10%
CA38	24212101	CD, 100pF, ±10%
CA42	24763221	EL, 220μF, ±20%, 16V
CA43	24232103	CD, 0.01μF, +80%, -20%
CA44	24232103	CD, 0.01μF, +80%, -20%
CA68	24794100	EL, 10μF, ±20%, 16V
CA69	24232103	CD, 0.01μF, +80%, -20%
CB01	24794470	EL, 47μF, ±20%, 16V
CB20	24212101	CD, 100pF, ±10%
CG02	24794220	EL, 22μF, ±20%, 16V
CG03	24539104	PF, 0.1μF
CG05	24797010	EL, 1μF, ±20%, 50V
CG06	24797479	EL, 4.7μF, ±20%, 50V
CG07	24797229	EL, 2.2μF, ±20%, 50V
CG08	24591473	PF, 0.047μF
CG09	24797478	EL, 0.47μF, ±20%, 50V
CG10	24539104	PF, 0.1μF
CG12	24206108	EL, 0.1μF, ±20%, 50V
CG14	24797010	EL, 1μF, ±20%, 50V
CG16	24704106	Tantalum, 10μF, ±20%, 16V
CG17	24797010	EL, 1μF, ±20%, 50V
CG18	24797010	EL, 1μF, ±20%, 50V
CG19	24797479	EL, 4.7μF, ±20%, 50V
CG20	24797010	EL, 1μF, ±20%, 50V
CG25	24797479	EL, 4.7μF, ±20%, 50V
CG26	24797479	EL, 4.7μF, ±20%, 50V
CG27	24591223	PF, 0.022μF
CG28	24797229	EL, 2.2μF, ±20%, 50V
CG29	24591102	PF, 1000pF
CG30	24206108	EL, 0.1μF, ±20%, 50V
CG31	24797229	EL, 2.2μF, ±20%, 50V
CG32	24591102	PF, 1000pF
CG33	24206108	EL, 0.1μF, ±20%, 50V

Location No.	Part No.	Description
CG38	24206229	EL, 2.2μF, ±20%, 50V
CG39	24206229	EL, 2.2μF, ±20%, 50V
CG42	24797010	EL, 1μF, ±20%, 50V
CG44	24794100	EL, 10μF, ±20%, 16V
CG46	24794100	EL, 10μF, ±20%, 16V
CM05	24212101	CD, 100pF, ±10%
CM08	24539104	PF, 0.1μF
CR01	24797478	EL, 0.47μF, ±20%, 50V
CR02	24797478	EL, 0.47μF, ±20%, 50V
CR03	24797478	EL, 0.47μF, ±20%, 50V
CV06	24797478	EL, 0.47μF, ±20%, 50V
RESISTORS		
R101	24382223	OMF, 22k ohm, 1W
R201	24381391	OMF, 390 ohm, 1/2W
R202	24366152	CF, 1500 ohm
R203	24366152	CF, 1500 ohm
R208	24366184	CF, 180k ohm
R228	24367113	CF, 11k ohm, ±2%
R230	24366223	CF, 22k ohm
R231	24366103	CF, 10k ohm
R235	24366154	CF, 150k ohm
R236	24366101	CF, 100 ohm
R237	24366101	CF, 100 ohm
R238	24366332	CF, 3300 ohm
R241	24366433	CF, 43k ohm
R242	24366473	CF, 47k ohm
R245	24366224	CF, 220k ohm
R246	24366225	CF, 2.2M ohm
R247	24366471	CF, 470 ohm
R301	24366102	CF, 1k ohm
R302	24383471	OMF, 470 ohm, 2W
R303	24321109	MF, 1 ohm, 1/2W
R304	24366473	CF, 47k ohm
R305	24322758	MF, 0.75 ohm, 1W
R306	24366683	CF, 68k ohm
R307	24366394	CF, 390k ohm
R308	24366102	CF, 1k ohm
R309	24553680	OMF, 68 ohm, 1W
R310	24366163	CF, 16k ohm
R311	24366332	CF, 3300 ohm
R313	24366154	CF, 150k ohm
R317	24366273	CF, 27k ohm
R327	24339569	MF, 5.6 ohm, 2W
R336	24383271	OMF, 270 ohm, 2W
R337	24366223	CF, 22k ohm
R338	24366223	CF, 22k ohm
R345	24366564	CF, 560k ohm
R370	24321109	MF, 1 ohm, 1/2W
R371	24366133	CF, 13k ohm
R372	24366562	CF, 5600 ohm
R374	24366153	CF, 15k ohm
R375	24366102	CF, 1k ohm
R379	24366102	CF, 1k ohm
R401	24366391	CF, 390 ohm
R402	24366103	CF, 10k ohm
R403	24366332	CF, 3300 ohm
R405	24382682	OMF, 6800 ohm, 1W
R406	24366333	CF, 33k ohm
R407	24366223	CF, 22k ohm
R408	24366821	CF, 820 ohm
R410	24366271	CF, 270 ohm
R411	24366331	CF, 330 ohm
R415	24553222	OMF, 2200 ohm, 1W

SPECIFIC INFORMATIONS

Location No.	Part No.	Description
R418	24531120	FR, 12 ohm, 1/2W
R421	24321339	MF, 3.3 ohm, 1/2W
R422	24366471	CF, 470 ohm
R430	24366102	CF, 1k ohm
R431	24366103	CF, 10k ohm
R432	24366202	CF, 2k ohm
R442	24532102	FR, 1k ohm, 1W
R448	24338478	MF, 0.47 ohm, 1W
R472	24552270	OMF, 27 ohm, 1/2W
⚠R475	24366391	CF, 390 ohm
R476	24366823	CF, 82k ohm
R477	24366273	CF, 27k ohm
⚠R478	24327133	MF, 13k ohm, ±1%, 1/4W
R481	24366333	CF, 33k ohm
⚠R482	24327472	MF, 4700 ohm, ±1%, 1/4W
R485	24322568	MF, 0.56 ohm, 1W
R486	24552820	OMF, 82 ohm, 1/2W
R487	24552301	OMF, 300 ohm, 1/2W
R488	24327183	MF, 18k ohm, ±1%, 1/4W
R489	24327183	MF, 18k ohm, ±1%, 1/4W
R490	24366102	CF, 1k ohm
R493	24366102	CF, 1k ohm
R494	24366471	CF, 470 ohm
R495	24366561	CF, 560 ohm
R503	24366334	CF, 330k ohm
R504	24366332	CF, 3300 ohm
R610	24366223	CF, 22k ohm
R614	24366102	CF, 1k ohm
R661	24366103	CF, 10k ohm
R662	24366103	CF, 10k ohm
R663	24366332	CF, 3300 ohm
R664	24366332	CF, 3300 ohm
R668	24366103	CF, 10k ohm
R669	24366103	CF, 10k ohm
R676	24366229	CF, 2.2 ohm
R677	24366229	CF, 2.2 ohm
R808	24019483	PTC Thermistor, 7.0 ohm
R810	24568109	Cement, 1 ohm, 7W
R830	24381330	OMF, 33 ohm, 1/2W
R831	24366681	CF, 680 ohm
R861	24382103	OMF, 10k ohm, 1W
R862	24552330	OMF, 33 ohm, 1/2W
R864	24552102	OMF, 1k ohm, 1/2W
R865	24552470	OMF, 47 ohm, 1/2W
R866	24552470	OMF, 47 ohm, 1/2W
R867	24366123	CF, 12k ohm
R870	24381101	OMF, 100 ohm, 1/2W
R871	24381101	OMF, 100 ohm, 1/2W
R872	24382104	OMF, 100k ohm, 1W
R883	24381153	OMF, 15k ohm, 1/2W
R884	24366102	CF, 1k ohm
R891	24366102	CF, 1k ohm
R898	24002000	CC, 3.9M ohm, ±10%, 1/2W
R901	24376102	CF, 1k ohm, 1/2W
R902	24376102	CF, 1k ohm, 1/2W
R903	24376102	CF, 1k ohm, 1/2W
R911	24366561	CF, 560 ohm
R912	24366561	CF, 560 ohm
R913	24366561	CF, 560 ohm
R920	24000961	FR, 2.2 ohm, 2W
R921	24366271	CF, 270 ohm
R922	24366271	CF, 270 ohm
R923	24366271	CF, 270 ohm
R931	24366102	CF, 1k ohm

Location No.	Part No.	Description
R932	24366102	CF, 1k ohm
R933	24366102	CF, 1k ohm
R961	24554153	OMF, 15k ohm, 2W
R962	24554153	OMF, 15k ohm, 2W
R963	24554153	OMF, 15k ohm, 2W
R971	24366821	CF, 820 ohm
R972	24366102	CF, 1k ohm
R973	24366122	CF, 1200 ohm
R974	24366221	CF, 220 ohm
RA03	24366102	CF, 1k ohm
RA04	24366102	CF, 1k ohm
RA07	24366102	CF, 1k ohm
RA08	24366102	CF, 1k ohm
RA12	24366103	CF, 10k ohm
RA13	24366102	CF, 1k ohm
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA22	24366472	CF, 4700 ohm
RA23	24366472	CF, 4700 ohm
RA24	24366472	CF, 4700 ohm
RA25	24366682	CF, 6800 ohm
RA26	24366102	CF, 1k ohm
RA27	24366102	CF, 1k ohm
RA33	24366103	CF, 10k ohm
RA34	24366102	CF, 1k ohm
RA35	24366102	CF, 1k ohm
RA37	24366331	CF, 330 ohm
RA38	24366331	CF, 330 ohm
RA40	24366102	CF, 1k ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA67	24366472	CF, 4700 ohm
RA68	24366472	CF, 4700 ohm
RA70	24366333	CF, 33k ohm
RA71	24366683	CF, 68k ohm
RA72	24366223	CF, 22k ohm
RA73	24366103	CF, 10k ohm
RB01	24366271	CF, 270 ohm
RB03	24366101	CF, 100 ohm
RB09	24366470	CF, 47 ohm
RB11	24366103	CF, 10k ohm
RB26	24366103	CF, 10k ohm
RB27	24366103	CF, 10k ohm
RB28	24366104	CF, 100k ohm
RB30	24366103	CF, 10k ohm
RB40	24366103	CF, 10k ohm
RB41	24366152	CF, 1500 ohm
RB42	24366102	CF, 1k ohm
RB43	24366103	CF, 10k ohm
RB44	24366103	CF, 10k ohm
RB45	24366181	CF, 180 ohm
RB46	24366101	CF, 100 ohm
RG05	24366102	CF, 1k ohm
RG08	24366394	CF, 390k ohm
RG09	24366223	CF, 22k ohm
RG14	24366332	CF, 3300 ohm
RG15	24327153	MF, 15k ohm, ±1%, 1/4W
RG16	24366162	CF, 1600 ohm
RG17	24366472	CF, 4700 ohm
RG22	24366101	CF, 100 ohm
RG23	24366101	CF, 100 ohm
RG43	24366472	CF, 4700 ohm
RG44	24366222	CF, 2200 ohm

Location No.	Part No.	Description
RM02	24366332	CF, 3300 ohm
RM41	24366101	CF, 100 ohm
RR90	24366122	CF, 1200 ohm
RR91	24366122	CF, 1200 ohm
RR92	24366122	CF, 1200 ohm
RR93	24366472	CF, 4700 ohm
RS21	24366472	CF, 4700 ohm
RS24	24366472	CF, 4700 ohm
RV01	24366750	CF, 75 ohm

COILS & TRANSFORMERS

Location No.	Part No.	Description
L101	23289220	Coil, Peaking, TRF4220AF
L205	23289846	Coil, Peaking, TRF4101AT
L301	23103880	Coil (Ferrite Bead), TEM2011Y
L400	23289100	Coil, Peaking, TRF4100AF
⚠ L441	23233045	Coil, Linearity, TLN2083G
L805	23248227	Coil, Choke, TLN3481AD
L806	23248227	Coil, Choke, TLN3481AD
L883	23103880	Coil (Ferrite Bead), TEM2011Y
L884	23103880	Coil (Ferrite Bead), TEM2011Y
L885	23248073	Coil, Choke, TLN3299D
L886	23103880	Coil (Ferrite Bead), TEM2011Y
L888	23103880	Coil (Ferrite Bead), TEM2011Y
L901	23200789	Coil, Degaussing, TSB-2205A
LA01	23289100	Coil, Peaking, TRF4100AF
LB02	23289470	Coil, Peaking, TRF4470AF
T401	23224367	Transformer, Horiz. Drive, TLN1098AH
⚠ T461	23236578	Transformer, Flyback, TFB4125ED
T801	23211720	Line Filter, TRF3202BQ
T840	23213513	Transformer, Power, TPW1459AZ
T862	23217308	Transformer, Converter, TPW3318AG

SEMICONDUCTORS

Location No.	Part No.	Description
Q301	B0378560	IC, TA8427K
Q301B	72471082	Screw, BRDT2W3X10 SZN
Q370	23114530	Transistor, 2SA933S-Q
Q402	A6330069	Transistor, 2CS2482 FA-1
Q403	23314444	Transistor, 2SC4721P
Q404	A6873702	Transistor, 2SD2539
Q404B	72471082	Screw, BRDT2W3X10 SZN
Q421	23314141	Transistor, 2SC3852
Q421B	23035308	Screw, BTB3X8SZN
Q471	A6534020	Transistor, 2SA1015-O
Q472	23114528	Transistor, 2SC1740S, Q
Q480	A6532853	Transistor, 2SA949-Y(C)
Q481	23114528	Transistor, 2SC1740S, Q
Q482	23114528	Transistor, 2SC1740S, Q
Q483	A6012010	Transistor, RN2201
Q501	B0385424	IC, TA1223AN
Q610	B01A0068	IC, TA8265K
Q610B	70391355	Screw, BITTB3X8 SZN
Q611	A6342200	Transistor, 2CS2878-A
Q613	A6342200	Transistor, 2CS2878-A
Q801	23906369	IC, STR-Z4214
Q801B	23476828	Bracket
Q830	23114552	Transistor, 2SC1685-Q, TH
Q840	23318299	IC, L78MR05
Q843	A6002050	Transistor, RN1205
Q862	A8643135	Photo Coupler, TLP621(GRL)
⚠ Q883	A6907894	IC, S1854A(FA4)

Location No.	Part No.	Description
Q901	A6363200	Transistor, 2CS3619
Q902	A6363200	Transistor, 2CS3619
Q903	A6363200	Transistor, 2CS3619
Q904	23114528	Transistor, 2SC1740S, Q
Q905	23114528	Transistor, 2SC1740S, Q
Q906	23114528	Transistor, 2SC1740S, Q
Q971	23114530	Transistor, 2SA933S-Q
QA01	23000262	IC, TMPA8700CMN-1A03
QA02	70129483	IC, AT24C0210PC
QB01	23114528	Transistor, 2SC1740S, Q
QB03	A6002050	Transistor, RN1205
QB21	23114528	Transistor, 2SC1740S, Q
QB30	23114528	Transistor, 2SC1740S, Q
QB40	23114528	Transistor, 2SC1740S, Q
QG01	23906499	IC, μPC1851BCU
D101	23316411	Diode, Zener, HZT33-12
D201	23316656	Diode, Zener, MTZJ3.3A
D205	23118859	Diode, 1SS133
D210	23118859	Diode, 1SS133
D220	23118859	Diode, 1SS133
D301	23118094	Diode, EU2A, LF-F10
D302	23118095	Diode, ERB44-06, E
D308	23118822	Diode, ERB12-02
D309	23118822	Diode, ERB12-02
D310	23118859	Diode, 1SS133
D370	23316671	Diode, Zener, MTZJ5.6A
D406	23118095	Diode, ERB44-06, E
D408	A7580658	Diode, 3JH41
D409	23316690	Diode, Zener, MTZJ10B
D421	23316690	Diode, Zener, MTZJ10B
D441	23316687	Diode, Zener, MTZJ9.1B
D445	23118094	Diode, EU2A, LF-F10
D471	23118095	Diode, ERB44-06, E
⚠ D472	23115774	Diode, Zener, RD6.2E(4)
D473	23118859	Diode, 1SS133
D480	23316757	Diode, Zener, MTZJ36A
D801	A7568754	Diode, 1S1887A FA-1
D802	A7568754	Diode, 1S1887A FA-1
D803	A7568754	Diode, 1S1887A FA-1
D804	A7568754	Diode, 1S1887A FA-1
D830	23316673	Diode, Zener, MTZJ5.6C
D840	23316962	Diode, S1WBA20 4101
D845	23118859	Diode, 1SS133
D862	23118094	Diode, EU2A, LF-F10
D864	23118094	Diode, EU2A, LF-F10
D873	23316719	Diode, Zener, MTZJ12B
D875	23316719	Diode, Zener, MTZJ12B
D876	23316761	Diode, Zener, MTZJ39A
D881	23118859	Diode, 1SS133
D883	23357021	Diode, EL1 LF-G2
D884	23357021	Diode, EL1 LF-G2
D885	23118094	Diode, EU2A, LF-F10
D886	23118094	Diode, EU2A, LF-F10
D898	23316746	Diode, Zener, MTZJ27B
D899	24019472	Varistor, ENE271D-10A2
DA42	23316672	Diode, Zener, MTZJ5.6B
DB01	23358501	Diode (LED), SCL003URC5F
DB03	23358522	Diode (LED), SIR-56SB3F
DB30	23118859	Diode, 1SS133
DB45	23118859	Diode, 1SS133

MISCELLANEOUS

Location No.	Part No.	Description
B110	23162263	Holder, Antenna Terminal
B230	23035312	Screw, BTB 3X12 SZN

Location No.	Part No.	Description
F470	23144805	Fuse, 1.6A, 250V
F470A	23165433	Holder, Fuse
F801	23144888	Fuse, 5.0A, 125V
F801A	23165433	Holder, Fuse
F860	23144511	Fuse, 4.0A, 125V
F889	23144776	Fuse, 1.6A, 125V
G217	24366103	CF, 10k ohm
G500	23238714	Coil, Peaking, TRF4100AJ
G506	24366101	CF, 100 ohm
G507	24366101	CF, 100 ohm
G508	24366101	CF, 100 ohm
G520	24366332	CF, 3300 ohm
G521	24366332	CF, 3300 ohm
G861	23103880	Coil (Ferrite Bead), TEM2011Y
⚠ G882	23316653	Diode, Zener, MTZJ2.7B
G903	23118859	Diode, 1SS133
KB01	23906805	Remote Sensor, PIC-TB17
P801	23372114	Power Cord
PV03	23365833	Jack, Phono, 3P
SA01	23145227	Switch, Push, 1C1P
SA02	23145227	Switch, Push, 1C1P
SA03	23145227	Switch, Push, 1C1P
SA04	23145227	Switch, Push, 1C1P
SA05	23145227	Switch, Push, 1C1P
SA06	23145227	Switch, Push, 1C1P
SA07	23145227	Switch, Push, 1C1P
SR81	23146564	Relay, DC12V
V901A	23902068	Socket, CRT, 10P
W661	23151225	Speaker, SPK-1228, 60X90, 8 ohm
W662	23151225	Speaker, SPK-1228, 60X90, 8 ohm
X401	23153721	Ceramic Resonator, 503kHz, TCR1023
X501	23153961	Crystal, 3.58MHz
XA01	23153504	Ceramic Resonator, 8.00MHz, TCR1056BM

PC BOARD ASSEMBLIES

Location No.	Part No.	Description
* M051Z		Main Board, PB9416-1
* M052Z		CRT Drive Board, PB9416-2

PICTURE TUBE

Location No.	Part No.	Description
⚠ V901	23312662	Picture Tube, A68ADT28X02

TUNER

Location No.	Part No.	Description
H001	23321366	Tuner, EL951L

ACCESSORIES

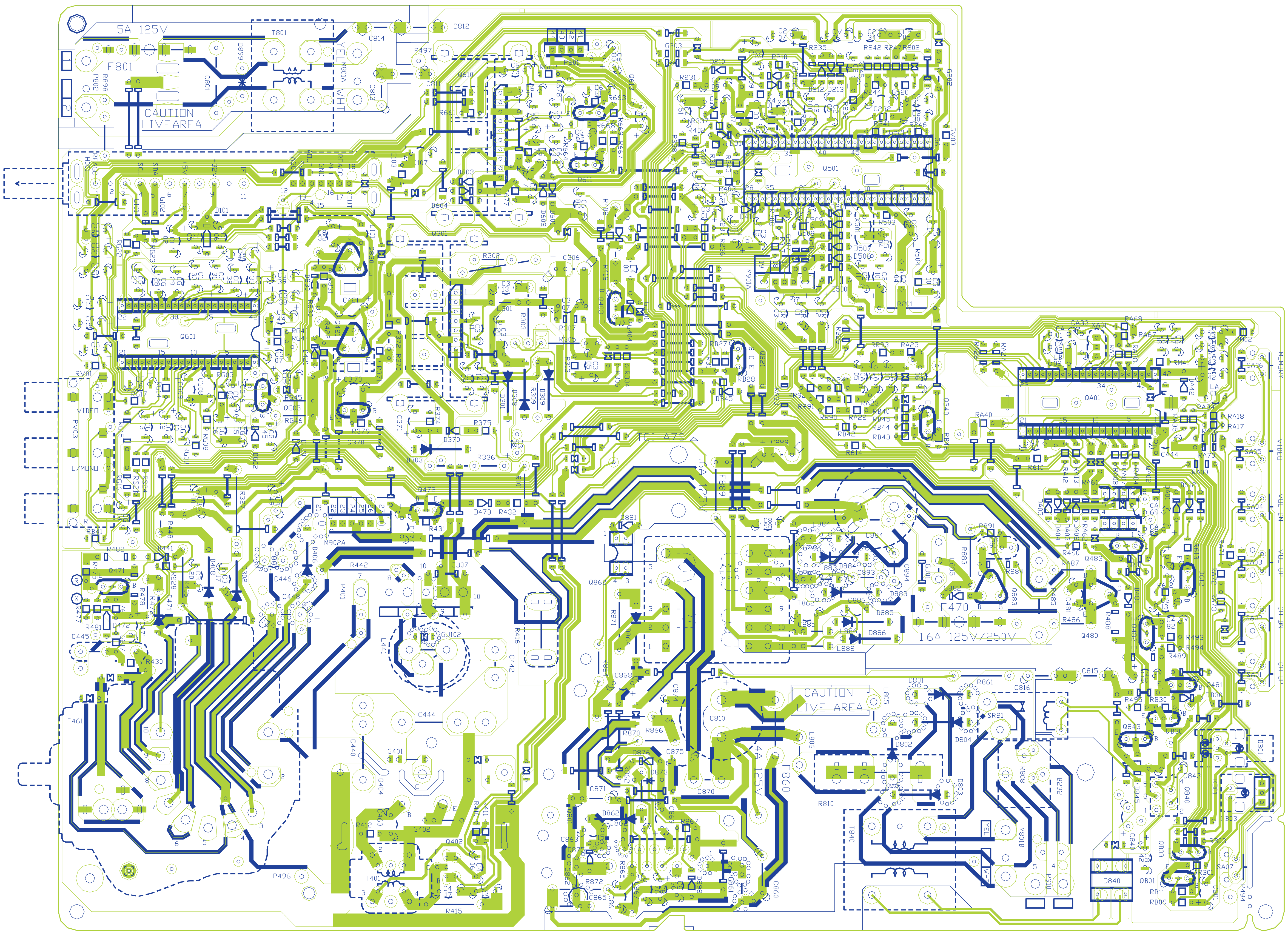
Location No.	Part No.	Description
K912	23306309	Remote Hand Unit, CT-9988
AT03	23588409	Battery Cover
Y101	23563895	Owner's Manual, English, 27A30
Y101F	23563896	Owner's Manual, French, 27A30

CABINET PARTS

Location No.	Part No.	Description
A201	23549910	Front Cover
A223	23445381	Button, Power
A411	23427122	Back Cover
A701	23524502	Container
A703	23935360	Packing, Top
A708	23935361	Packing, Bottom

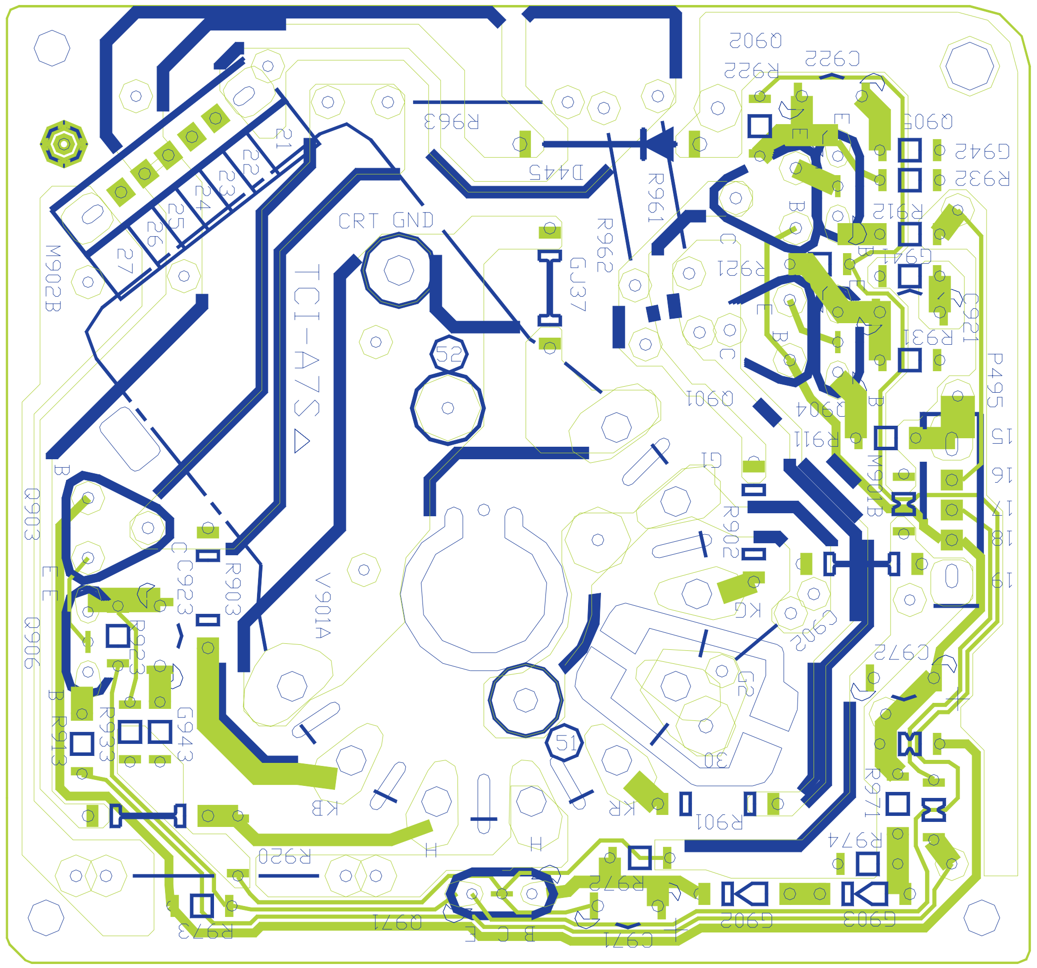
MAIN BOARD PB9416-1

BOTTOM (FOIL) SIDE



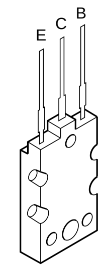
CRT-D DRIVE BOARD PB9416-2

BOTTOM (FOIL) SIDE

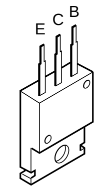


TERMINAL VIEW OF TRANSISTORS

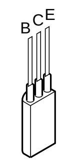
① 2SD2253 (old)
2SC5243



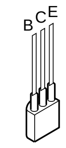
② 2SC3852
2SD1763A
2SC1569
2SC4544
2SA1788
2SA1306
2SA1186A



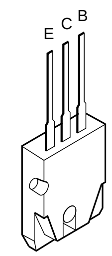
③ 2SC752GTM
2SC2482
2SC2655
2SC4721P



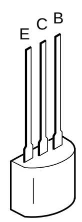
④ 2SC752
2SA562TM
2SA1015
2SC1815
2SC2878
2SC1740S
2SC2120
2SA9335



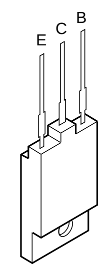
⑤ 2SA1788



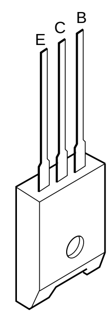
⑥ RN2203
RN2201
RN2004
RN1203
RN1204
RN2204
RN1205
RN1202
RN1201



⑦ 2SD1554
2SD2253
2SD1556
2SC5143
2SD2553
2SD2539



⑧ ON4409



MEMO

MEMO

SPECIFICATIONS

TELEVISION SYSTEM:	NTSC standard
CHANNEL COVERAGE:	VHF: 2 through 13 UHF: 14 through 69 Cable TV: Mid band (A-8 through A-1, A through I) Super band (J through W) Hyper band (AA through ZZ, AAA, BBB) Ultra band (65 through 94, 100 through 125)
POWER SOURCE:	120V AC, 60Hz
POWER CONSUMPTION:	79W (average)
AUDIO POWER:	2W + 2W
SPEAKER TYPE:	Two 2-3/8 x 3-9/16 inches (60 x 90 mm)
VIDEO/AUDIO TERMINALS:	VIDEO/AUDIO INPUT VIDEO: 1V(p-p), 75 ohm, negative sync. AUDIO: 150mV(rms) (30% modulation equivalent, 47k ohm)
DIMENSIONS:	Width .... 25-63/64 inches (660mm) Height .... 24-19/64 inches (617mm) Depth .... 22 inches (558.5mm)
MASS:	74.3 lbs (33.7 kg)
SUPPLIED ACCESSORIES:	Remote Control with 2 size “AA” batteries

* Please refer to owner’s manual in detail.

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN

SCHEMATIC DIAGRAM

MODEL : 27A30 Chassis No. TAC0006

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON THE MANUAL FOR THIS MODEL.

CAUTION: The international hazard symbols "⚠" in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on the MANUAL for this model. Do not degrade the safety of the receiver through improper servicing.

NOTE:

1. RESISTOR — Resistance is shown in ohm [K = 1.000, M = 1.000.000]. All resistors are 1/6W and 5% tolerance carbon resistor, unless otherwise noted as the following marks.
   1/2R = Metal or Metal oxide of 1/2 watt — 1/2S = Carbon compsistion of 1/2 watt
   1RF = Fuse resistor of 1 watt — 10W = Cement of 10 watt
   K = ±10% G = ±2% F = ±1%
2. CAPACITOR — Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF, and the values more than 1 in pF.
   All capacitors are ceramic 50V, unless otherwise noted as the following marks.
   +┤├ Electolytic capacitor — Ⓜ┤├ Mylar capacitor
3. The parts indicated with " ⚠ " have special characteristics, and should be replaced with identical parts only.
4. Voltages read with DIGITAL MULTI-METER from point indicated to chassing ground, using a color bar signal with all controls at normal, line voltage 120 volts.
5. Waveforms are taken receiving color bar signal with enough sensitivity.
6. Voltage reading shown are nominal values and may vary ±20% except H.V.

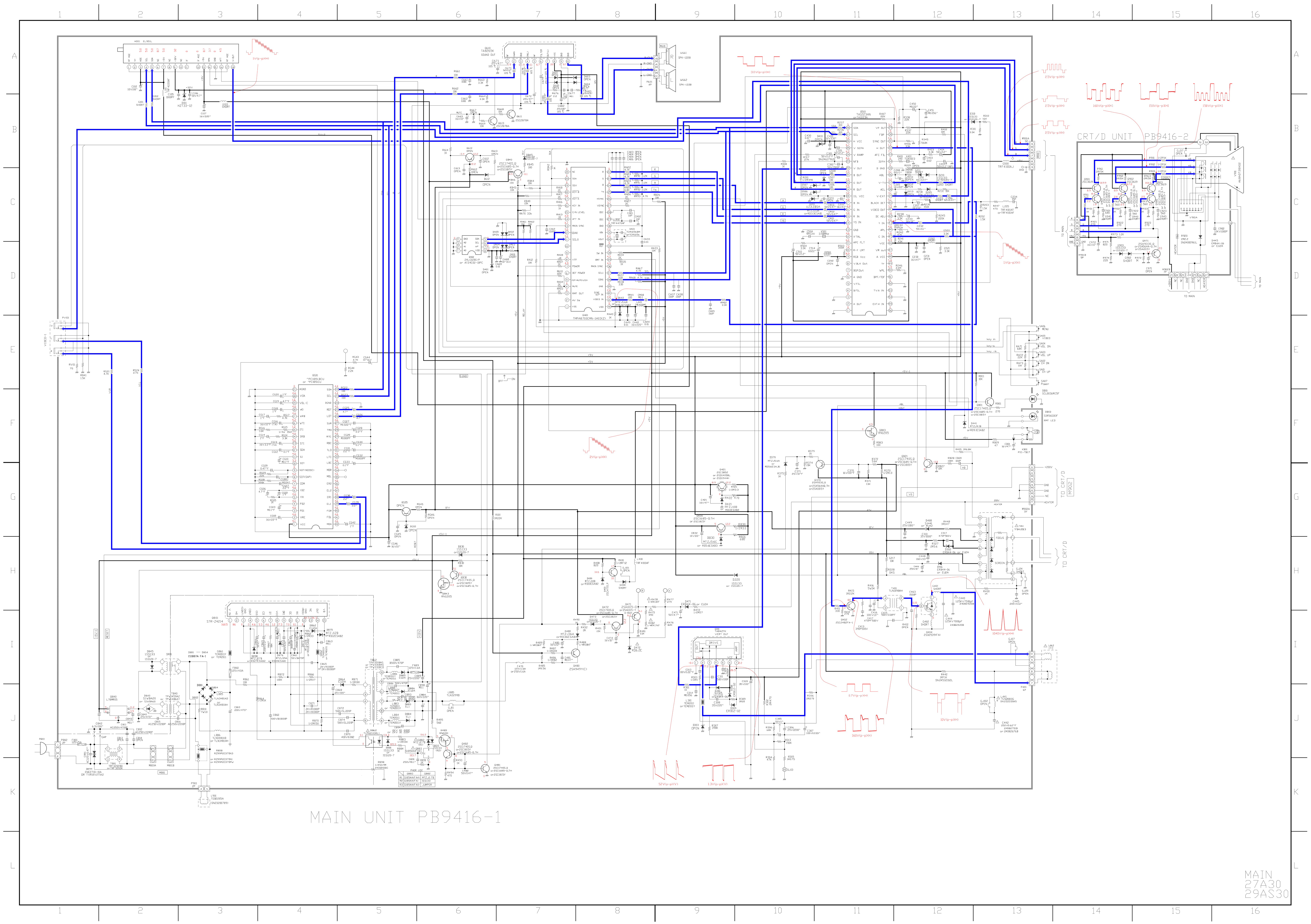
SCHEMATIC DIAGRAM   MODEL : 27A30   Chassis No. TAC0006

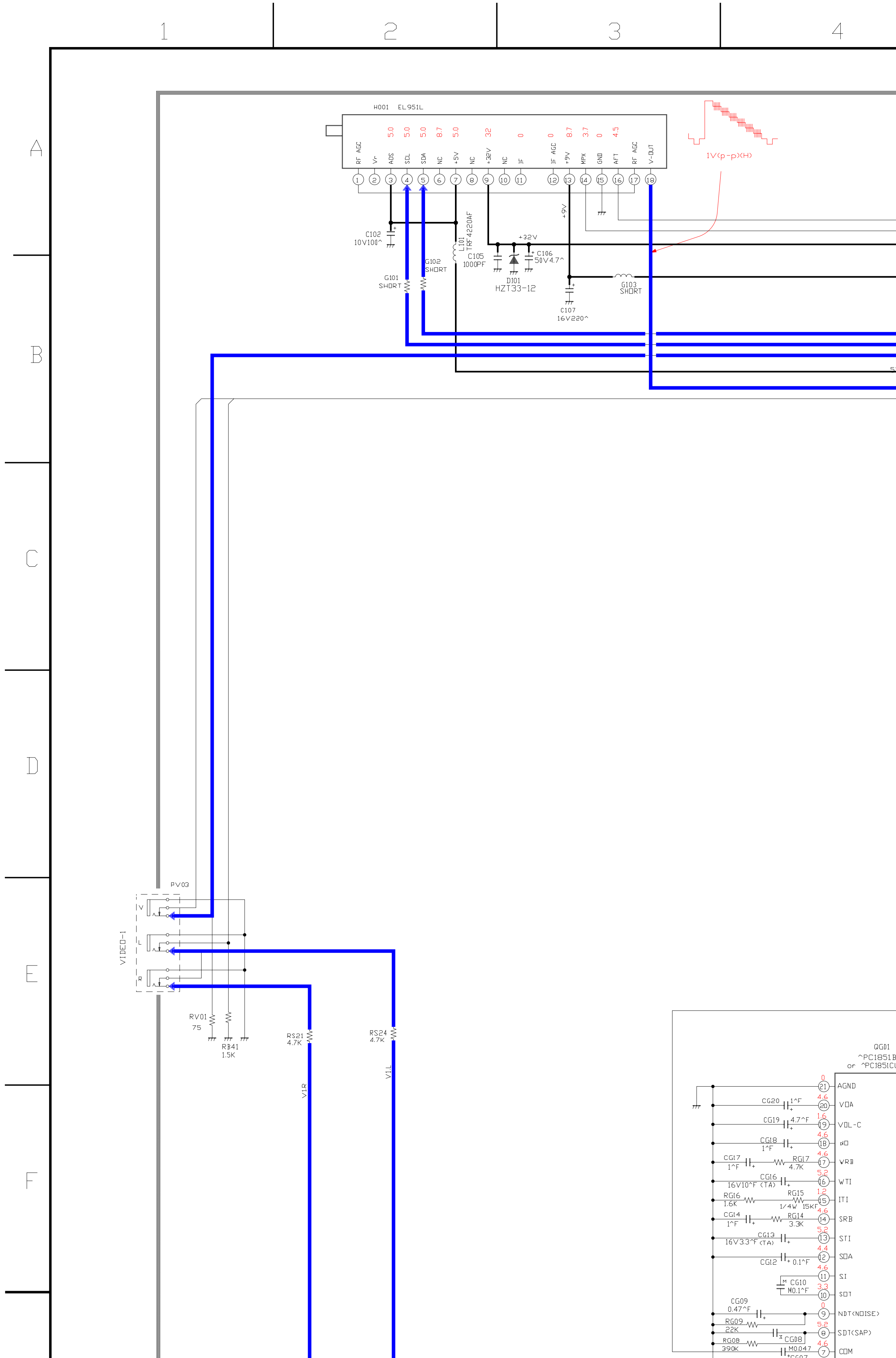
WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON THE MANUAL FOR THIS MODEL.

CAUTION: The international hazard symbols "⚠" in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on the MANUAL for this model. Do not degrade the safety of the receiver through improper servicing.

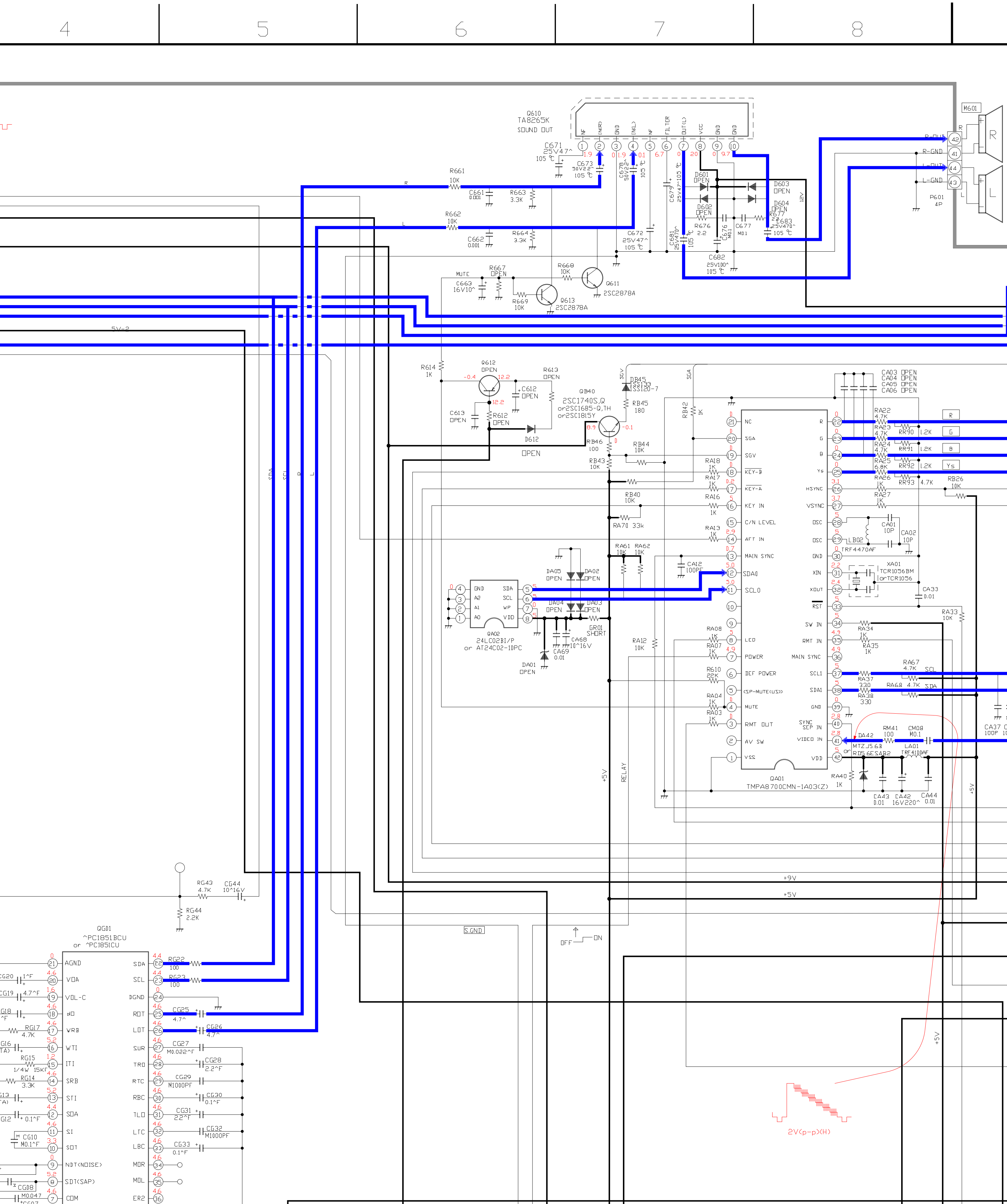
NOTE:

1. RESISTOR Resistance is shown in ohm [K = 1.000, M = 1.000.000]. All resistors are 1/6W and 5% tolerance carbon resistor, unless otherwise noted as the following marks.
   1/2R = Metal or Metal oxide of 1/2 watt   1/2S = Carbon compsistion of 1/2 watt
   1RF = Fuse resistor of 1 watt   10W = Cement of 10 watt
   K = ±10% G = ±2% F = ±1%
2. CAPACITOR Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF, and the values more than 1 in pF.
   All capacitors are ceramic 50V, unless otherwise noted as the following marks.
   Electolytic capacitor   Mylar capacitor
3. The parts indicated with " ⚠ " have special characteristics, and should be replaced with identical parts only.
4. Voltages read with DIGITAL MULTI-METER from point indicated to chassing ground, using a color bar signal with all controls at normal, line voltage 120 volts.
5. Waveforms are taken receiving color bar signal with enough sensitivity.
6. Voltage reading shown are nominal values and may vary ±20% except H.V.

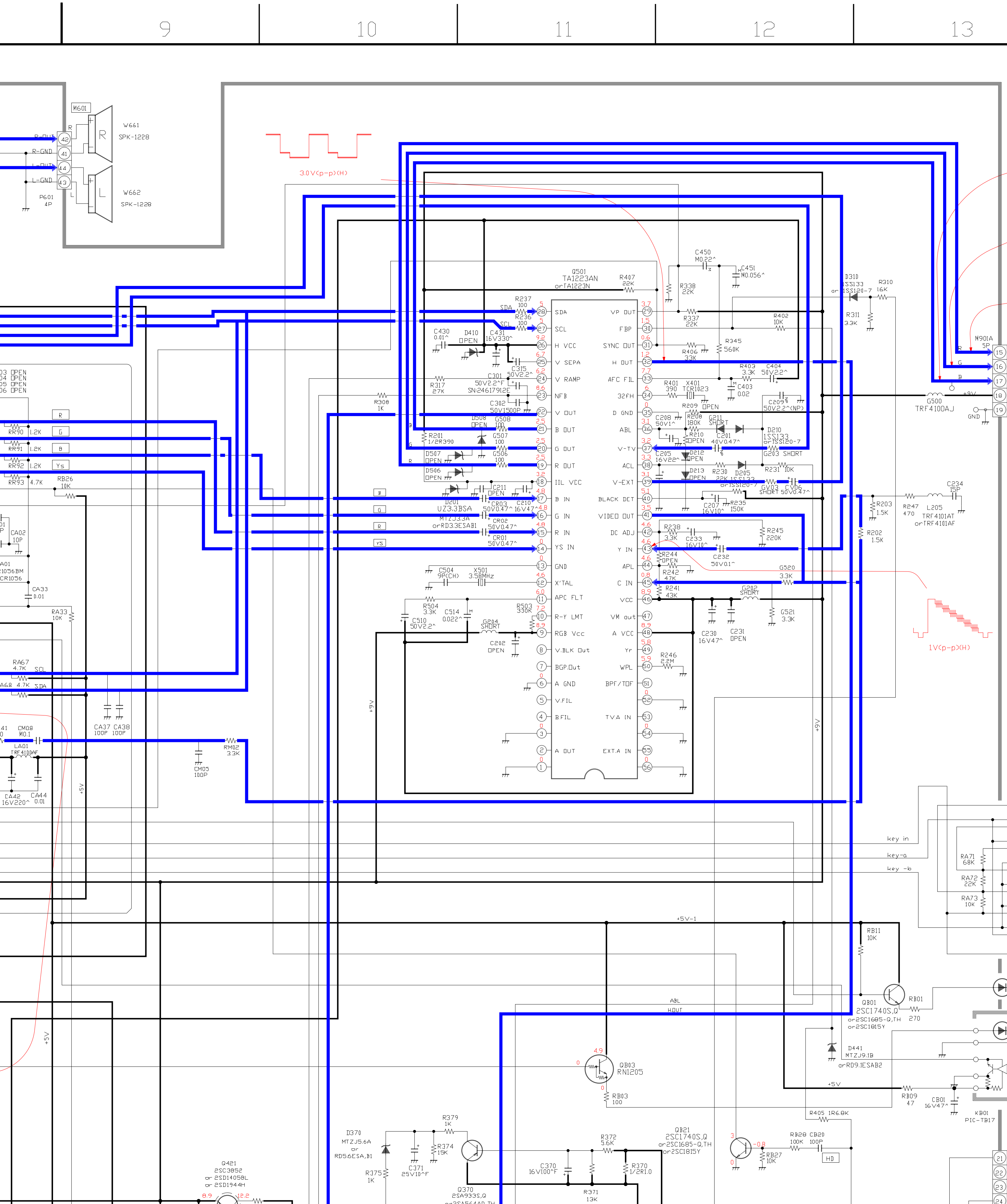




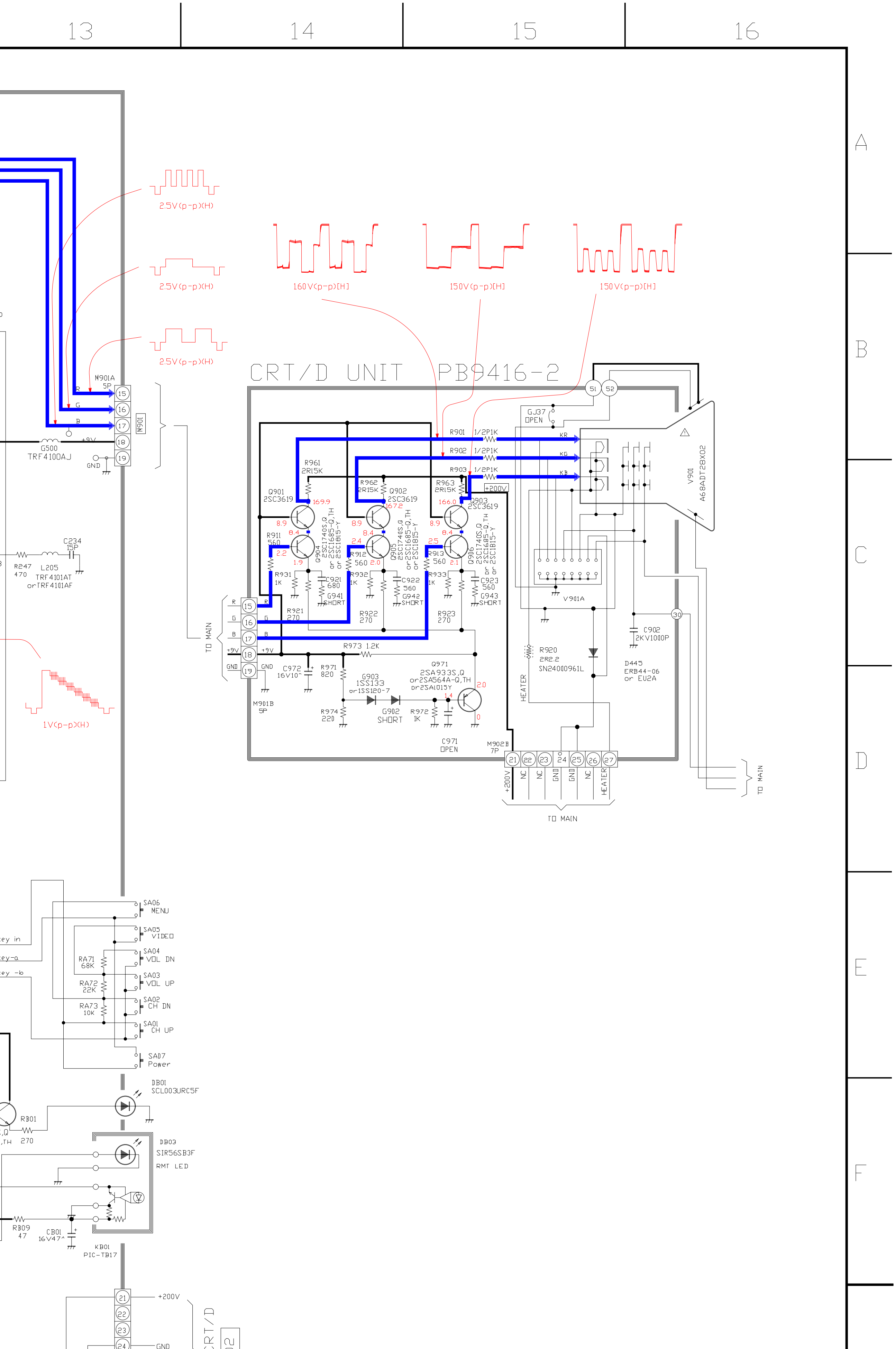
1
2
3
4
A
B
C
D
E
F
H001 EL951L
RF AGC
V+
ADS
SCL
SDA
NC
+5V
NC
+32V
NC
IF
IF AGC
+9V
MPX
GND
AFT
RF AGC
V-OUT
5.0
5.0
5.0
8.7
5.0
32
0
0
8.7
3.7
0
4.5
1V(p-p)(H)
C102
10V100^
L101
TRF4220AF
+32V
+9V
C105
1000PF
C106
50V4.7^
D101
HZT33-12
G101
SHORT
G102
SHORT
G103
SHORT
C107
16V220^
PV03
VIDEO-1
V
L
R
RV01
75
RB41
1.5K
RS21
4.7K
RS24
4.7K
V1R
V1L
QG01
^PC1851B
or ^PC1851C
AGND
VDA
VOL-C
øD
VRB
WTI
ITI
SRB
STI
SDA
SI
SOT
NOT(NOISE)
SOT(SAP)
COM
CG20
1^F
CG19
4.7^F
CG18
1^F
CG17
1^F
RG17
4.7K
CG16
16V10^F (TA)
RG16
1.6K
RG15
1/4W 15K
CG14
1^F
RG14
3.3K
CG13
16V3.3^F (TA)
CG12
0.1^F
CG10
M0.1^F
CG09
0.47^F
RG09
22K
CG08
RG08
390K
M0.047

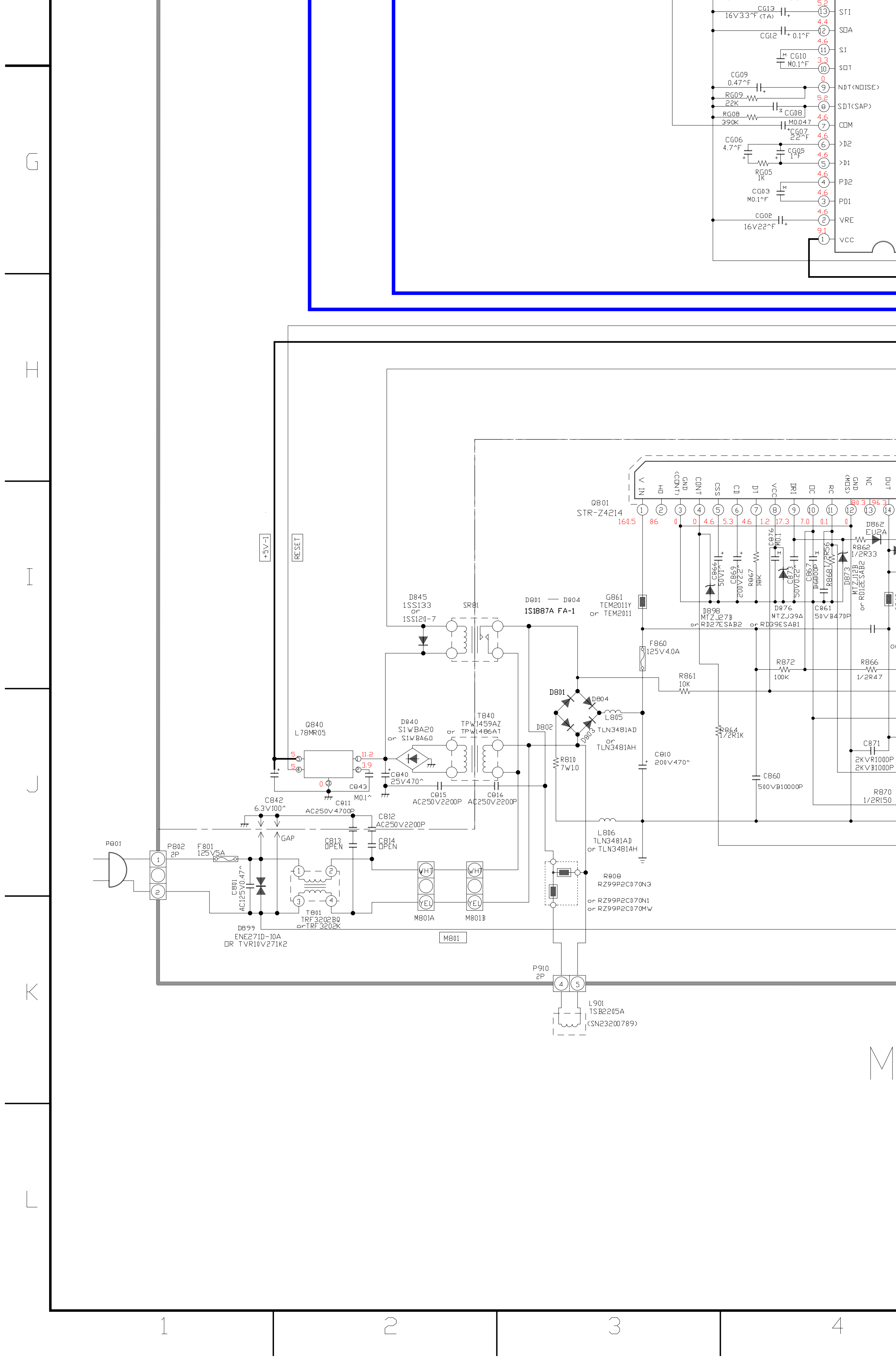


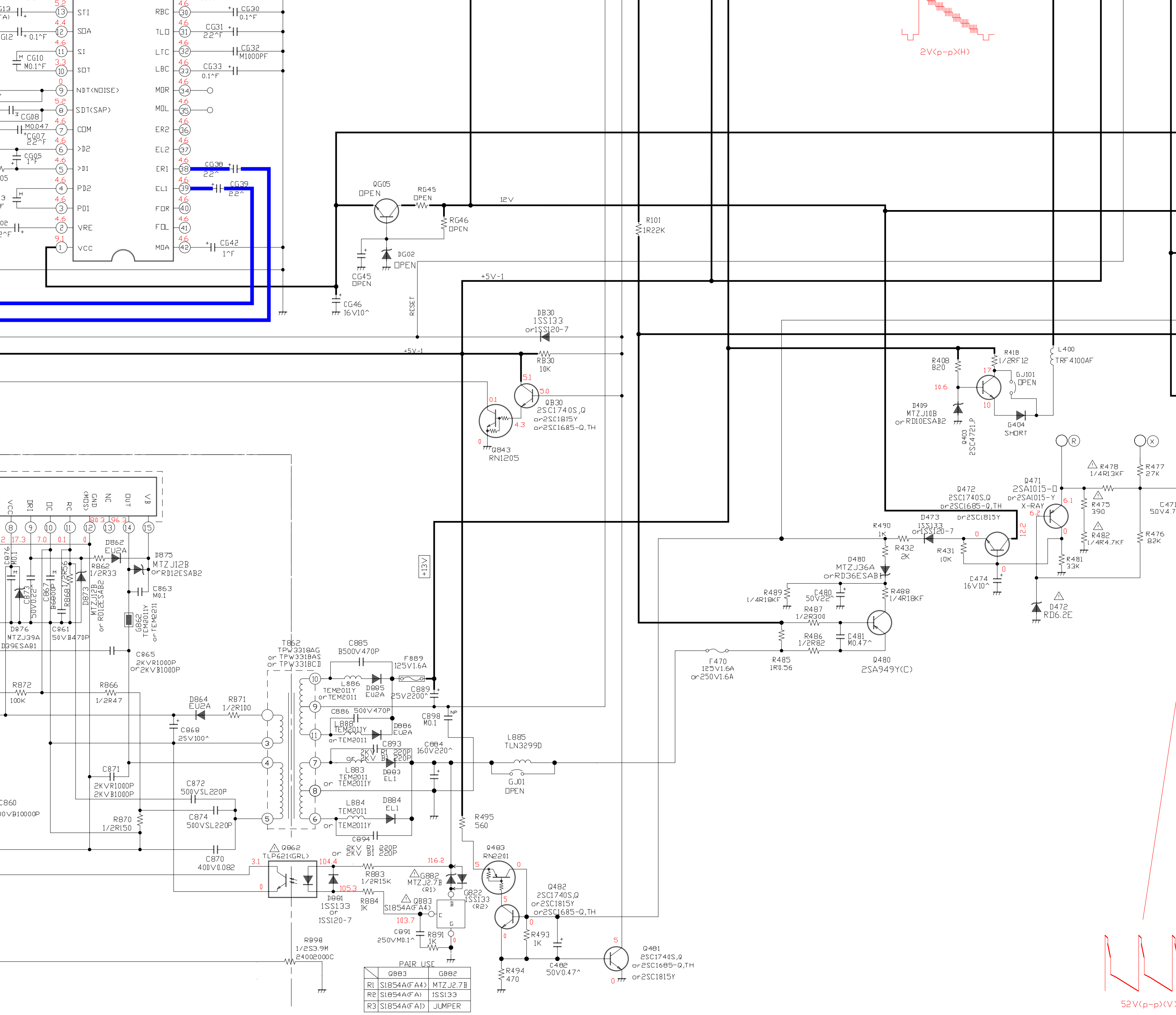
4
5
6
7
8
Q610
TA8265K
SOUND OUT
M601
R-OUT
R-GND
L-OUT
L-GND
P601
4P
C671
25V47^
105 ℃
C673
50V22^
105 ℃
C678
50V22^
R661
10K
R662
10K
C661
0.001
C662
0.001
R663
3.3K
R664
3.3K
C672
25V47^
105 ℃
C679
25V47^ 105 ℃
C681
25V470^
105 ℃
D601
OPEN
D602
OPEN
D603
OPEN
D604
OPEN
R677
2.2
R676
2.2
C676
M0.1
C677
M0.1
C683
25V470^
105 ℃
C682
25V100^
105 ℃
12V
MUTE
C663
16V10^
R667
OPEN
R668
10K
R669
10K
Q611
2SC2878A
Q613
2SC2878A
5V-2
R614
1K
Q612
OPEN
R613
OPEN
C612
OPEN
C613
OPEN
R612
OPEN
D612
OPEN
QB40
2SC1740S,Q
or2SC1685-Q,TH
or2SC1815Y
DB45
1SS133
1SS120-7
RB45
180
RB42
1K
RB46
100
RB43
10K
RB44
10K
RB40
10K
RA70 33k
RA61 10K
RA62 10K
CA12
100PF
DA05
OPEN
DA02
OPEN
DA04
OPEN
DA03
OPEN
GR01
SHORT
CA68
10^16V
CA69
0.01
DA01
OPEN
QA02
24LC02BI/P
or AT24C02-10PC
GND
A2
A1
A0
SDA
SCL
WP
VDD
RA12
10K
+5V
RELAY
QA01
TMPA8700CMN-1A03(Z)
NC
SGA
SGV
KEY-B
KEY-A
KEY IN
C/N LEVEL
AFT IN
MAIN SYNC
SDA0
SCL0
LED
POWER
DEF POWER
(SP-MUTE(US))
MUTE
RMT OUT
AV SW
VSS
HSYNC
VSYNC
OSC
GND
XIN
XOUT
RST
SW IN
RMT IN
MAIN SYNC
SCL1
SDA1
SYNC SEP IN
VIDEO IN
VDD
RA18
1K
RA17
1K
RA16
1K
RA13
1K
RA08
RA07
1K
R610
22K
RA04
1K
RA03
1K
CA03 OPEN
CA04 OPEN
CA05 OPEN
CA06 OPEN
RA22
4.7K
RA23
4.7K
RA24
4.7K
RA25
6.8K
RA26
1K
RA27
1K
RR90
1.2K
RR91
1.2K
RR92
1.2K
RR93
4.7K
RB26
10K
CA01
10P
CA02
10P
LB02
TRF4470AF
XA01
TCR1056BM
orTCR1056
CA33
0.01
RA33
10K
RA34
1K
RA35
1K
RA67
4.7K
RA68 4.7K
RA37
330
RA38
330
CA37
100P
RM41
100
CM08
M0.1
LA01
TRF4100AF
DA42
MTZJ5.6B
or RD5.6ESAB2
RA40
1K
CA43
0.01
CA42
16V220^
CA44
0.01
+9V
+5V
S.GND
OFF
ON
RG43
4.7K
CG44
10^16V
RG44
2.2K
QG01
^PC1851BCU
or ^PC1851CU
AGND
VDA
VOL-C
dO
VRB
WTI
ITI
SRB
STI
SDA
SI
SOT
NDT(NOISE)
SDT(SAP)
COM
SDA
SCL
DGND
ROT
LOT
SUR
TRO
RTC
RBC
TLO
LTC
LBC
MOR
MOL
ER2
RG22
100
RG23
100
CG25
4.7^
CG26
4.7^
CG27
M0.022^F
CG28
2.2^F
CG29
M1000PF
CG30
0.1^F
CG31
22^F
CG32
M1000PF
CG33
0.1^F
RG17
4.7K
RG15
1/4W 15KF
RG14
3.3K
CG10
M0.1^F
CG08
M0.047
2V(p-p)(H)



9
10
11
12
13
M601
W661
SPK-1228
W662
SPK-1228
P601
4P
R-OUT
R-GND
L-OUT
L-GND
3.0V(p-p)(H)
Q501
TA1223AN
orTA1223N
SDA
SCL
H VCC
V SEPA
V RAMP
NFB
V OUT
B OUT
G OUT
R OUT
IIL VCC
B IN
G IN
R IN
YS IN
GND
X'TAL
APC FLT
R-Y LMT
RGB Vcc
V.BLK Out
BGP.Out
A GND
V.FIL
B.FIL
A OUT
VP OUT
FBP
SYNC OUT
H OUT
AFC FIL
32fH
D GND
ABL
V-TV
ACL
V-EXT
BLACK DET
VIDEO OUT
DC ADJ
Y IN
APL
C IN
VCC
VM out
A VCC
Yr
WPL
BPF/TOF
TVA IN
EXT.A IN
C450
M0.22^
C451
M0.056^
R407
22K
R338
22K
R337
22K
R402
10K
R345
560K
R406
33K
R403
3.3K
C404
50V22^
R401
390
X401
TCR1023
C403
0.02
D310
1SS133
or 1SS120-7
R310
16K
R311
3.3K
N901A
5P
G500
TRF4100AJ
+9V
GND
C209
50V2.2^(NP)
R209 OPEN
R206
180K
C208
50V1^
G211
SHORT
D210
1SS133
or 1SS120-7
R210
OPEN
C201
40V0.47^
G203 SHORT
C205
16V22^
D212
OPEN
R230
22K
D205
1SS133
or 1SS120-7
R231 10K
D213
OPEN
GV03
SHORT
CV06
50V0.47^
C207
16V10^
R235
150K
C234
15P
R203
1.5K
R247
470
L205
TRF4101AT
orTRF4101AF
R202
1.5K
R238
3.3K
C233
16V10^
R245
220K
R244
OPEN
C232
50V1^
R242
47K
G520
3.3K
R241
43K
G202
SHORT
G521
3.3K
C230
16V47^
C231
OPEN
R246
2.2M
1V(p-p)(H)
R237
100
R236
100
C430
0.01^
D410
OPEN
C431
16V330^
C315
50V2.2^
C301
50V2.2^F
SN:246179126
R317
27K
C302
50V1500P
R308
1K
D508
OPEN
G508
100
R201
1/2R390
G507
100
D507
OPEN
G506
100
D506
OPEN
C211
OPEN
D201
UZ3.3BSA
MTZJ3.3A
orRD3.3ESAB1
CR03
50V0.47^
C210
16V47^
CR02
50V0.47^
CR01
50V0.47^
C504
9P(CH)
X501
3.58MHz
R504
3.3K
C514
0.022^
C510
50V2.2^
R503
330K
G204
SHORT
C202
OPEN
RR90 1.2K
RR91 1.2K
RR92 1.2K
RR93 4.7K
RB26
10K
CA02
10P
CA33
0.01
RA33
10K
RA67
4.7K
RA68 4.7K
CA37 CA38
100P 100P
CM08
M0.1
LA01
TRF4100AF
RM02
3.3K
CM05
100P
CA42
16V220^
CA44
0.01
+5V
+9V
+5V-1
key in
key-a
key -b
RA71
68K
RA72
22K
RA73
10K
RB11
10K
QB01
2SC1740S,Q
or2SC1685-Q,TH
or2SC1815Y
RB01
270
D441
MTZJ9.1B
orRD9.1ESAB2
+5V
RB09
47
CB01
16V47^
KB01
PIC-TB17
ABL
HOUT
QB03
RN1205
RB03
100
R379
1K
D370
MTZJ5.6A
or
RD5.6ESA,B1
R374
15K
C371
25V10^F
R375
1K
Q370
2SA933S,Q
R372
5.6K
QB21
2SC1740S,Q
or2SC1685-Q,TH
or2SC1815Y
C370
16V100^F
R370
1/2R1.0
R371
13K
R405 1R6.8K
RB28
100K
CB20
100P
RB27
10K
HD
Q421
2SC3852
or 2SD1405BL
or 2SD1944H

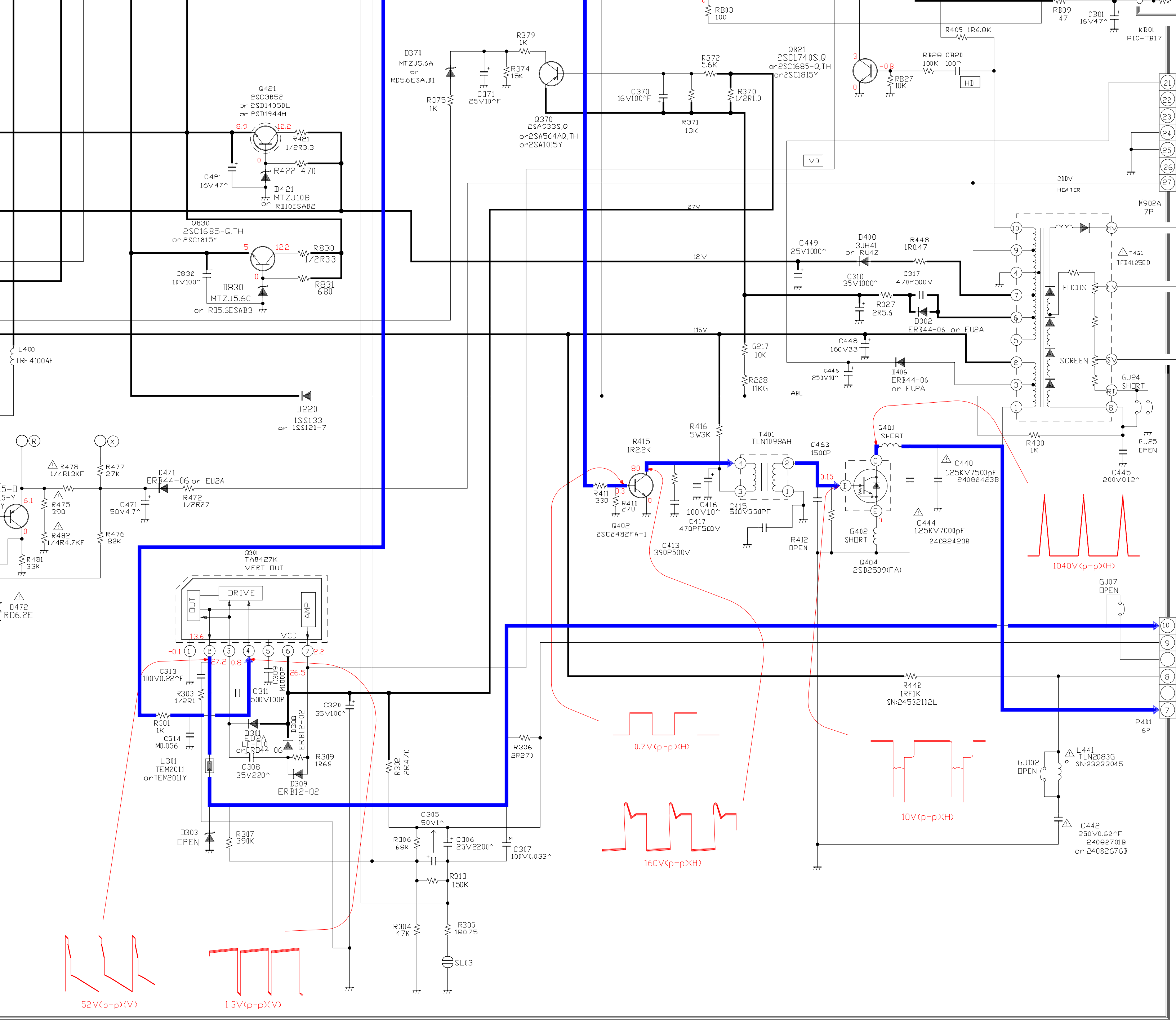

13
14
15
16
A
B
C
D
E
F
CRT/D UNIT PB9416-2
2.5V(p-p)(H)
2.5V(p-p)(H)
2.5V(p-p)(H)
160V(p-p)[H]
150V(p-p)[H]
150V(p-p)[H]
1V(p-p)(H)
N901A 5P
M901
G500 TRF4100AJ
R247 470
L205 TRF4101AT or TRF4101AF
C234 15P
R901 1/2P1K
R902 1/2P1K
R903 1/2P1K
R961 2R15K
R962 2R15K
R963 2R15K
Q901 2SC3619
Q902 2SC3619
Q903 2SC3619
Q904 2SC1740S,Q or 2SC1685-Q,TH or 2SC1815-Y
Q905 2SC1740S,Q or 2SC1685-Q,TH or 2SC1815-Y
Q906 2SC1740S,Q or 2SC1685-Q,TH or 2SC1815-Y
R911 560
R912 560
R913 560
R931 1K
R932 1K
R933 1K
C921 680
C922 560
C923 560
G941 SHORT
G942 SHORT
G943 SHORT
R921 270
R922 270
R923 270
R973 1.2K
C972 16V10
R971 820
G903 1SS133 or 1SS120-7
Q971 2SA933S,Q or 2SA564A-Q,TH or 2SA1015Y
R974 220
G902 SHORT
R972 1K
C971 OPEN
M901B 5P
M902B 7P
TO MAIN
+200V
GJ37 OPEN
KR
KG
KB
V901 A68ADT28X02
V901A
C902 2KV1000P
R920 2R2.2 SN24000961L
D445 ERB44-06 or EU2A
HEATER
+200V NC NC GND GND NC HEATER
TO MAIN
SA06 MENU
SA05 VIDEO
SA04 VOL DN
SA03 VOL UP
SA02 CH DN
SA01 CH UP
SA07 Power
RA71 68K
RA72 22K
RA73 10K
DB01 SCL003URC5F
RB01 270
DB03 SIR56SB3F
RMT LED
RB09 47
CB01 16V47
KB01 PIC-TB17
+200V
GND



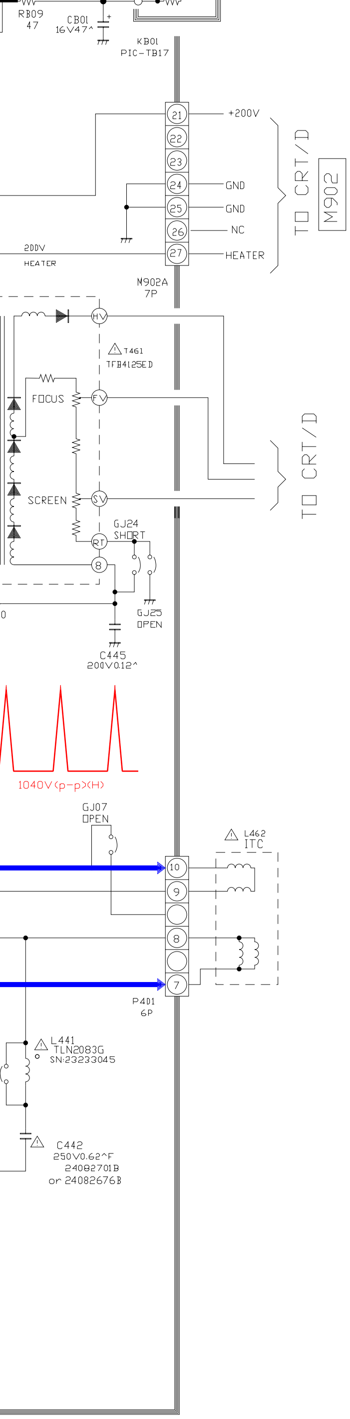


MAIN UNIT PB9416-1

4	5	6	7	8


Q301
TA8427K
VERT OUT
DRIVE
OUT
AMP
VCC
T401
TLN1098AH
Q404
2SD2539(FA)
Q402
2SC2482FA-1
Q821
2SC1740S,Q
Q370
2SA933S,Q
Q421
2SC3852
Q830
2SC1685-Q.TH
T461
TFB4125ED
FOCUS
SCREEN
HEATER
200V
27V
12V
115V
ABL
VD
HD
P401
6P
M902A
7P
KB01
PIC-TB17
52V(p-p)(V)
1.3V(p-p)(V)
0.7V(p-p)(H)
160V(p-p)(H)
10V(p-p)(H)
1040V(p-p)(H)

9	10	11	12	13



MAIN
27A30
29AS30

G	H	I	J	K	L

13 14 15 16